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No. 96-

IN THE

Supreme Court of the United States

OCTOBER TERM, 1996

CRYO-TRANS, INC.,

Petitioner,

v.

GENERAL AMERICAN TRANSPORTATION CORPORATION,

Respondent.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

PETITION FOR A WRIT OF CERTIORARI

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QUESTION PRESENTED

In *Markman v. Westview Instruments,* this Court recognized that the construction of a patent claim presents a mixed question of fact and law for the trial judge. Is the U.S. Court of Appeals for the Federal Circuit correct in its practice of according no deference to the underlying fact findings upon which the trial judge's claim construction in a patent infringement action is based?

PARTIES TO THE PROCEEDING

The parties to the proceedings in the United States Court of Appeals for the Federal Circuit were Petitioner Cryo-Trans, Inc. and Respondent General American Transportation Corporation. Cryo-Trans, Inc. does not have any parent companies or subsidiaries.

TABLE OF CONTENTS

Page

QUESTION PRESENTED i

PARTIES TO THE PROCEEDING ii

TABLE OF AUTHORITIES v

OPINIONS BELOW 1

JURISDICTION 2

FEDERAL RULE INVOLVED 2

STATEMENT OF THE CASE 3

1. The Cryo-Trans Invention 4
2. GATC's Accused Railcar 7
3. District Court Proceedings 8
4. The Federal Circuit's Decision 11

REASONS FOR GRANTING THE PETITION 14

I. The Petition Raises an Important Issue 14

II. The Federal Circuit's Practice Is in Conflict with Supreme Court Precedent 17

CONCLUSION 23

APPENDIX:

Opinions of the United States Court of Appeals for the Federal Circuit (Aug. 14, 1996) 1a

Memorandum Opinion and Order of the United States District Court (July 14, 1995) 18a

Memorandum Opinion and Order of the United States District Court Supplementing Findings and Judgment (Sept. 1, 1995) 67a

Order of the United States Court of Appeals Denying Petition for Rehearing and Suggestion for Rehearing in Banc (Oct. 10, 1996) 77a

TABLE OF AUTHORITIES

Page

Cases:

Anderson v. City of Bessemer City, 470 U.S. 564 (1985) 19

Baumgartner v. United States, 322 U.S. 665 (1944) . . . 20

Cooter & Gell v. Hartmarx Corp., 496 U.S. 384 (1990) 18, 21

Elf Atochem North Am. Inc. v. Libbey-Owens Ford Co., 37 U.S.P.Q. 2d 1065 (D. Del. 1995) 16

Exxon Chem. Patents, Inc. v. Lubrizol Corp., 64 F.3d 1553 (Fed. Cir. 1995), *cert. denied*, 116 S. Ct. 2554 (1996) 15

Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 72 F.3d 857 (Fed. Cir. 1995) 15

First Options of Chicago, Inc. v. Kaplan, 115 S. Ct. 1920 (1995) 18, 20, 22

Gasperini v. Center for Humanities, Inc., 116 S. Ct. 2211 (1996) 17, 19

Hoechst Celanese Corp. v. BP Chem. Ltd., 78 F.3d 1575 (Fed. Cir.), *cert. denied*, 65 U.S.L.W. 3265 (U.S. 1996) 15

Huang v. Autoshade, Inc., CV 92 6487 RJK (C.D. Cal. Nov. 13, 1996) 14

(Table of Authorities continued)

Page

Loral Fairchild Corp. v. Victor Co. of Japan, 906 F. Supp. 798 (E.D.N.Y. 1995) 14

Lucas-Aerospace, Ltd. v. Unison Indus., L.P., 890 F. Supp. 329 (D. Del. 1995) 16

Markman v. Westview Instruments, Inc., 517 U.S. ___, 116 S. Ct. 1384 (1996) . . . . . *passim*

Markman v. Westview Instruments, Inc., 52 F.3d 967 (Fed. Cir. 1995) (in banc), *aff'd*, 116 S. Ct. 1384 (1996) . . . . . *passim*

Metaullics Sys. Co. v. Cooper, No. 96-1290 (Fed. Cir. Nov. 15, 1996) 17

Miller v. Fenton, 474 U.S. 104 (1985) 17, 21

Moll v. Northern Telecom, Inc., No. 94-5451 (E.D. Pa. Jan. 2, 1996) 14

Ornelas v. United States, 116 S. Ct. 1657 (1996) . . 18, 19, 22

Salve Regina College v. Russell, 499 U.S. 225 (1991) . . 18, 22

United Carbon Co. v. Binney Co., 317 U.S. 228 (1942) . . 19

Wainwright v. Sykes, 433 U.S. 72 (1977) 17

Weiner v. NEC Elec., Inc., No. 96-1052 (Fed. Cir. Dec. 6, 1996) 17

(Table of Authorities continued)

Page

Winans v. Denmead, 56 U.S. (15 How.) 330 (1853) . . 21, 22

***Statutes and Rules*:**

28 U.S.C. § 1254(1) 2

28 U.S.C. §§ 1292(c), 1295 3

Fed. R. Civ. P. 52(a) 2, 4, 9, 22

***Miscellaneous*:**

Steven Alan Childress & Martha S. Davis, *Federal Standards of Review* (2d ed. 1992) 20

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PETITION FOR A WRIT OF CERTIORARI

Petitioner Cryo-Trans, Inc. respectfully petitions this Court to grant a writ of certiorari to review the judgment of the United States Court of Appeals for the Federal Circuit.

OPINIONS BELOW

The opinions of the court of appeals, Appendix ("App.") 1a-17a, are reported at 93 F.3d 766. The opinions of the district court, App. 18a-76a, are reported at 893 F. Supp. 774 and 897 F. Supp. 1121.

JURISDICTION

The judgment of the court of appeals was entered on August 14, 1996. App. 1a. A timely petition for rehearing and a suggestion for rehearing en banc was filed by Cryo-Trans on August 27, 1996, and was denied on October 10, 1996. App. 77a. The jurisdiction of this Court is invoked under 28 U.S.C. § 1254(1).

FEDERAL RULE INVOLVED

Rule 52 of the Federal Rules of Civil Procedure provides in part:

> **(a) Effect.** In all actions tried upon the facts without a jury or with an advisory jury, the court shall find specially and state separately its conclusions of law thereon, and judgment shall be entered pursuant to Rule 58; and in granting or refusing interlocutory injunctions the court shall similarly set forth the findings of fact and conclusions of law which constitute the grounds of its action. Requests for findings are not necessary for purposes of review. Findings of fact, whether based on oral or documentary evidence, shall not be set aside unless clearly erroneous, and due regard shall be given to the opportunity of the trial court to judge of the credibility of the witnesses. The findings of a master, to the extent that the court adopts them, shall be considered as the findings of the court. It will be sufficient if the findings of fact and conclusions of law are stated orally and recorded in open court following the close of the evidence or appear in an opinion or memorandum of decision filed by the court. Findings of fact and conclusions of law are necessary on decisions of motions under Rule 12 or

56 or any other motion except as provided in subdivision (c) of this rule.

STATEMENT OF THE CASE

Last Term, this Court ruled that the meaning of terms used in a patent claim is exclusively for a judge, not a jury, to decide. *Markman v. Westview Instruments, Inc.*, 517 U.S. ___, 116 S. Ct. 1384 (1996). The Court thus resolved an issue of crucial importance to patent litigants by removing any uncertainty as to the respective roles of the trial judge and jury in patent infringement actions. But the Court left open the equally pivotal and unsettled question regarding the deference owed by the U.S. Court of Appeals for the Federal Circuit in reviewing the trial judge's claim construction on appeal.[1] This case squarely raises that fundamental issue.

Importantly, the *Markman* Court indicated that patent claim construction presents a mixed question of law and fact. Under Rule 52(a) of the Federal Rules of Civil Procedure and Court precedent, such mixed questions presume some deference to underlying trial court findings of fact. The Federal Circuit, however, treats claim construction as a pure question of law, routinely according no deference to any district court determinations bound up in the claim interpretation analysis. That position and the absence of any clear direction from this Court on the proper standard of appellate review regarding claim construction has produced

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[1] The Federal Circuit possesses exclusive jurisdiction over appeals from judgments in civil actions for patent infringement. 28 U.S.C. §§ 1292(c), 1295. The proper appropriation of judicial duties as between the appellate court and trial judge in the critical claim construction area is unique to patent litigation, and since the Federal Circuit has exclusive jurisdiction over appeals in patent cases, issues relating to patent claim construction cannot be the subject of inter-circuit conflict.

palpable concern at the district court level, where patent infringement trials are administered throughout the nation.

This case focuses on the respective juridical responsibilities of the trial court and the court of appeals under the *Markman* regime. Whereas the trial judge here made various fact determinations in interpreting the claims to cover the accused infringing equipment, a divided panel of the Federal Circuit exceeded its appellate authority by rejecting the trial judge's claim construction without affording any apparent consideration to the trial judge's view of the evidence giving rise to that construction. Rather than accord proper deference to those findings as prescribed by Fed. R. Civ. P. 52(a), the majority independently reached a different interpretation that is inconsistent with the factual record developed at trial.

This case represents one of the latest in a line of post-*Markman* cases in which the Federal Circuit has routinely usurped the role of the district courts in patent infringement disputes through misapplication of the *de novo* standard of review. As a result, the court of appeals has for all practical purposes supplanted the district courts as the court of first instance on claim interpretation, typically a central issue in patent litigation. Without correction and clarification by this Court, the Federal Circuit's misapplication of its *de novo* authority will continue to dilute the fundamental role of the district courts in patent infringement actions.

1. The Cryo-Trans Invention

A substantial portion of frozen food products shipped throughout the United States is carried via the nation's rail

system. (A1604).[2] In the 1970's, the frozen-food industry grew increasingly concerned about the continued ability of the aging fleet of mechanically-refrigerated railcars to transport frozen food products over long distances. By the 1980's, the decline in the supply and reliability of mechanical refrigerator cars posed a significant threat to the industry's ability to meet growing demand. (A1424, 1608, 2561-72). To improve and preserve their long-haul transportation capabilities, frozen food producers and shippers initiated development of a "cryogenic" railcar, refrigerated by liquid carbon dioxide ("CO_2"), as an alternative to existing mechanical refrigerator cars. (A1522, 4482-95).

Between 1980-85, an industry-sponsored cryogenic railcar research project, under the direction of Mr. Ralph P. Hill, the eventual inventor of the Cryo-Trans patent in suit, produced several experimental railcars using various methods of cryogenic refrigeration. (A1428-29, 2561-63, 2576-89). The earliest prototypes utilized an overhead manifold at the ceiling of the car to spray liquid CO_2 directly on top of the load of frozen food products to form a covering of CO_2 snow. (A1429-30, 4655). Direct contact of solid CO_2 with the cargo, however, caused over-freezing of the products near the top of the load and did not allow the entire load to remain consistently frozen during the entire trip. (A1431).

In 1983, the project team designed a new prototype railcar that employed an overhead bunker to store CO_2 snow above the cargo load with openings, or vents, to allow cold CO_2 gas sublimating from the snow to drop down and cool the

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[2] "(A_____)" citations are to the record Appendix filed in the court of appeals.

load.[3] (A4659, 4664-65). Burlington Northern Railroad, a project team participant, produced 75 railcars incorporating the new bunker design. (A1453, 4566-67). But while the Burlington Northern bunker design avoided the problems associated with direct-contact refrigeration, it left "hot spots" resulting in the undesirable thawing of frozen products. (A1449-50, 3914). Due to the hot-spot problem, the Burlington Northern cars were never accepted in the marketplace, the cars ultimately were taken out of service, and the industry research project terminated in March 1985. (A1449-50, 1453, 3914).

Mr. Hill, however, did not give up. During the summer of 1985, he conceived of a cryogenic railcar design that effectively eliminated the hot-spot problems experienced by the Burlington Northern cars. (A1454, 3914-15, 3936-42). Mr. Hill's cryogenic refrigeration system included the use of vents situated around the ceiling bunker, as well as corrugated side and end walls, providing an even flow of sublimated CO_2 gas to the cargo area and keeping the entire load frozen. (A1465-66, 3936-37). Mr. Marvin H. Weiner, who became intimately familiar with the problems plaguing earlier cryogenic railcar prototypes as the owner of a storage facility receiving long-haul frozen-food shipments, saw in Mr. Hill's system the prospect of a commercially viable cryogenic railcar. (A1610, 1611-13). Mr. Weiner established Cryo-Trans, which ultimately developed and commercialized the invention. He assisted Mr. Hill in building a prototype of the cryogenic car, designated the "CRYX 1000," which debuted in March 1986. (A1312). The CRYX 1000 was tested and refined, and it proved to be the first truly successful cryogenic railcar.

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[3] CO_2 gas is 52% heavier than air. App. 28a.

The Cryo-Trans patent on Mr. Hill's cryogenic refrigeration system (U.S. Patent 4,704,876, referred to as "the '876 patent") was issued by the U.S. Patent and Trademark Office in 1987. (A2548-57). The '876 patent discloses Mr. Hill's concept of a railcar refrigerated by CO_2 snow held in a compartment that runs along the length of the car above the cargo area and contains openings, or vents, adjacent the side and end walls of the car to allow sublimation and proper distribution of CO_2 gas around the frozen food load. (A1465-66, 2554-56). The effective flow of the cold CO_2 gas around the load keeps the frozen food refrigerated, even on long cross-country journeys.

The CRYX 1000 was so well accepted in the marketplace that by 1989-90, Cryo-Trans had produced a total of 222 cars under lease with frozen food producers and shippers. (A5439). The trial court found that "food processors who leased Cryo-Trans' cars were able to ship their product at a transportation cost that was considerably lower than the cost of using the older, mechanical cars." App. 47a-48a. The court concluded that the Hill railcar design was an innovative, patentable improvement, *id.* at 56a-58a, and the Federal Circuit affirmed the validity of the '876 patent, *id.* at 12a.

2. GATC's Accused Railcar

In late 1990, respondent General American Transportation Corporation ("GATC") manufactured a prototype cryogenic railcar, known as the "GARX 68000," by copying the Cryo-Trans CRYX 1000. (A1690-95, 1754-56, 3246). The prototype was subsequently modified to make GATC's production car, styled the "Arcticar." The modification consisted of simply blocking the openings closest to the end walls of the car. (A1879-80). GATC argued that with this change, the Arcticar did not have openings "adjacent" the end walls as specified in the '876 patent

claims, even though the nearly 68-foot railcar still had openings located less than three feet from the end walls that provided the same cooling effect. GATC took orders for the Arcticar railcar beginning in early 1991.

3. District Court Proceedings

On March 1, 1991, GATC filed an action in the United States District Court for the Northern District of Illinois seeking a declaratory judgment that the '876 patent is invalid, unenforceable, and not infringed by GATC's Arcticar railcar. (A89-90). Cryo-Trans counterclaimed against GATC, alleging that GATC infringed and actively induced infringement of claims 1, 2, and 3 of the '876 patent. (A102-104).

Prior to trial, GATC stipulated that the GARX 68000 literally infringed the '876 patent. (A1314). In addition, GATC stipulated that the "only significant change made to the GARX 68000 in April 1981 relative to claims 1, 2, and 3 of the Hill '876 patent was the elimination of two ceiling bunker vents on each of the end walls of the railcar."[4] (A1315). Thus, the issue of infringement turned on whether GATC's modified railcar, the Arcticar, still met the claimed requirement of having "a plurality of openings" located "*adjacent* each of [the] side walls and end walls for permitting the flow of sublimated carbon dioxide gas." (A2556 [emphasis added]).

GATC did not dispute at trial that the Arcticar contained each and every element of claim 1 of the '876 patent except that it contended there were no bunker vents "adjacent" to the end walls. Specifically, GATC argued that because the vents

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[4] The number of ceiling vents so removed represented only four out of a total of 53. (A4478).

nearest to the end wall of the Arcticar are nearly three feet away, they are not "adjacent" to the end walls within the meaning of the claim.

The parties presented their cases to the district court in a ten-day bench trial, during which the court received testimony and documentary evidence relating to the issue of claim construction. App. 19a. Relying on the Federal Circuit's decision in *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir. 1995) (in banc), *aff'd*, 116 S. Ct. 1384 (1996), the trial court recognized that the "construction of a patent claim is a matter of law which can be determined by a review of all relevant evidence including the patent's prosecution history and extrinsic evidence regarding the true meaning of the language employed in the patent." App. 52a. Accordingly, in its Memorandum Opinion and Order under Fed. R. Civ. P. 52(a), the trial court made abundantly clear that its express "Findings of Fact and Conclusions of Law . . . are based upon consideration of all the admissible evidence as well as this Court's own assessment of the credibility of the trial witnesses." *Id.* at 20a.

The court relied on various sources of extrinsic evidence to provide a factual basis for interpreting "adjacent" as used in the patent claims and for determining whether the Arcticar has openings "adjacent" the end walls. Significantly, in addition to numerous technical documents and photographs detailing the structure of the accused Arcticar and a physical embodiment of the '876 patent (i.e., the production version of the CRYX 1000 railcar), the trial judge "conducted a site visit to personally inspect and view the railcars at issue." *Id.* at 19a.

The trial judge also considered the sworn testimony of Mr. George Gerstman, called as an expert in patent law, Mr. Lewis Tyree, a technical expert, and Mr. Hill himself. Mr.

Gerstman noted that the '876 patent did not provide any indication that the term "adjacent" should be given any meaning other than its ordinary meaning. Citing Webster's Third New International Dictionary (Defendant's Exhibit 134), Mr. Gerstman testified that the ordinary meaning of the term "adjacent" is "not far off." (A1898). He maintained that the endmost vents in the Arcticar, located less than three feet from the end walls of a 67 foot, 8 inch car (i.e., less than 5% of the total length of the car), should be considered "adjacent" within the ordinary meaning of the term as it is used in the '876 patent. (A1897).

Mr. Gerstman's view was strongly confirmed by Mr. Tyree and Mr. Hill. Mr. Tyree testified that the Arcticar "bunker vents which are three feet from the end wall of the car are sufficiently adjacent to provide, and will provide, a flow of sublimating CO_2 between the end walls and the load within the compartment both during the charging process and in-transit sublimation." (A3926). Mr. Tyree's testimony was uncontested at trial. Similarly, Mr. Hill explained that his invention operated by using "vents around the top of the [ceiling] bunker at the walls to allow vapor and cold air to flow downward through channels" on the walls and that the endmost vents in the Arcticar performed that precise function in relation to the end walls. (A1465-66).[5]

In view of the evidence adduced at trial, the district court found that the "term 'adjacent' as used in patents means not necessarily at but nearby or near," App. 43a, and concluded, likewise, that the term "as used in the '876 Patent means 'not far off,'" *id.* at 52a. Moreover, the court determined that

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[5] For that matter, GATC conceded that the Arcticar does not work any differently than its admittedly infringing prototype in the way the load is cooled. App. 50a.

"the purpose of the bunker vents of the '876 Patent is to facilitate the passage of sublimating CO_2 along the corrugations making up the walls of the car" and that the "Arcticar's bunker vents are close enough to provide the same function." *Id.* at 52a-53a. Thus, the district court ruled that "[g]iven the proximity of the Arcticar bunker vents to the end walls, the Arcticar literally infringes the '876 Patent."[6] *Id.* at 53a.

4. The Federal Circuit's Decision

On appeal, a split panel of the Federal Circuit reversed the district court's finding of infringement on the ground that the court had misconstrued the claims at issue. In articulating the applicable standard of review, the majority pronounced that "[c]laim construction is a question of law, reviewed *de novo* on appeal." *Id.* at 6a. Under its view of *de novo* review, the Federal Circuit majority rejected the district court's claim interpretation, adopting instead a contrary construction of the claims based on its own reading of the patent. The Federal Circuit majority confined itself exclusively to the "intrinsic" evidence, *i.e.*, the claim language and the specification of the '876 patent,[7] gave no apparent consideration to the "extrinsic" evidence which informed the trial judge, and undertook to interpret the claim

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[6] The trial court also held that the Arcticar infringed the '876 patent under the doctrine of equivalents, App. 53a, and that the patent is valid and enforceable, *id.* at 56a, 58a, 61a. The court awarded Cryo-Trans $9,705,172 in damages and permanently enjoined GATC from further infringement of the '876 patent. *Id.* at 64a. The damages award was later modified to $8,983,440. *Id.* at 73a.

[7] The majority acknowledged that the '876 patent's prosecution history "is brief and not helpful to resolving the meaning of the disputed claim language." App. 8a.

anew, without according any deference to the trial court's findings of fact based on evaluation of all the evidence.

Relying heavily on its interpretation of the patent specification, the majority concluded that the phrase "openings . . . adjacent each of said side walls and end walls" in claim 1 refers to

> structurally distinct openings that are provided adjacent to each of the railcar's four walls. Each opening is "adjacent" to only one wall, the nearest one to which it directs the downward flow of CO_2 gas. Thus, an opening "adjacent" to a side wall cannot also be an opening "adjacent" to an end wall. The patent does not contemplate the openings performing double duty in this manner. We therefore reject the district court's claim construction, which was inconsistent with the specification and drawings and rendered superfluous the claim requirement for openings adjacent to the end walls." [App. 8a].

In reaching that conclusion, the Federal Circuit ignored the fact findings that compelled the trial judge's construction of the claims. Whereas the trial judge had found that the GATC Arcticar meets the claimed requirement of openings "adjacent" the end walls in view of its findings that the Arcticar includes openings that are physically located near to the end walls and achieve the disclosed purpose of effectively refrigerating the entire frozen food load, the Federal Circuit majority concluded that there are no openings in the Arcticar "adjacent" the end walls because the specification appeared to indicate that "the openings were all closest to and thus 'adjacent' to the *side* walls." *Id.*

Circuit Judge Mayer, dissenting, was clearly critical of the majority's approach as rejecting the lower court's claim analysis without deferring properly to its assessment of the evidence. He accepted the ordinary meaning of "adjacent" found by the trial judge, stating that: "[T]he term 'adjacent' as used in the '876 patent means 'not far off.'" *Id.* at 13a. Moreover, he considered the majority's "citations to the claim language and specification to support a meaning other than the ordinary meaning of 'adjacent' [to be] misplaced."[8] *Id.* In so concluding, Circuit Judge Mayer reasoned that

> [t]his court's *de novo* claim construction would necessarily prevent a finding of infringement whenever a vent is nearer a side wall than an end wall. This cannot be. For example, a vent only an inch away from an end wall will not be considered "adjacent" to the end wall as long as the vent is less than an inch from a side wall. Given the dimensions at issue, surely a vent such a short distance from an end wall is "adjacent" to that wall and must be infringing. The difference between this hypothetical and our case is only a matter of degree. The vent here was only 33 inches from the wall of a railcar which is 812 inches long. *The district court is in a much better position to evaluate this matter of degree.* [App. 13a-14a (emphasis added)].

Cryo-Trans filed a petition for rehearing and a suggestion for rehearing en banc, which the court of appeals denied on October 10, 1996. App. 77a.

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[8] As an untenable consequence of the majority's claim interpretation, the prototype of Mr. Hill's invention (i.e., the original CRYX 1000) does not fall within the scope of the patent, notwithstanding that GATC had earlier admitted that "there is element-for-element correspondence between claims 1-3 of the '876 patent" and the prototype. (A5489).

REASONS FOR GRANTING THE PETITION

I. The Petition Raises an Important Issue

This petition should be granted because it raises an issue (i) of importance to the administration of justice, (ii) that regularly affects patent enforcement litigation, (iii) that is the subject of concern and criticism on the part of district court judges, and (iv) is of vital interest to patent litigants. The issue concerns the propriety of the Federal Circuit's practice of routinely according no deference to the lower court's findings of fact underlying the construction of patent claims pursuant to *Markman v. Westview Instruments, Inc.*, 116 S. Ct. 1384 (1996). This appellate practice eliminates the fact-finding role of the trial court, escalates the cost of patent litigation by heightening the necessity of appeal, and misallocates judicial resources in deciding the all-important question of claim construction.

More particularly, patent claim construction is a critical aspect of patent enforcement litigation. "[T]o decide what the claims mean is nearly always to decide the case." *Markman*, 52 F.3d at 989 (Mayer, J., concurring in the judgment). While *Markman* clarified that the task of construing the meaning of terms in patent claims in the first instance falls to the trial judge,[9] the Court left unresolved the follow-on issue of whether the Federal Circuit must give any deference to district court findings on underlying or subsidiary facts that

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[9] In the *Markman* regime, claim construction is now regularly being decided by trial judges in bench trials or in so-called "*Markman* hearings." *See e.g., Loral Fairchild Corp. v. Victor Co. of Japan*, 906 F. Supp. 798 (E.D.N.Y. 1995); *Moll v. Northern Telecom, Inc.*, No. 94-5451 (E.D. Pa. Jan. 2, 1996) (reprinted at 1996 U.S. Dist LEXIS 175); *Huang v. Autoshade, Inc.*, CV 92 6487 RJK (C.D. Cal. Nov. 13, 1996) (reprinted at 1996 U.S. Dist. LEXIS 17055).

might arise in construing the claims, particularly where the trial judge is the only fact finder.[10] There is a strong and immediate public interest in addressing this issue because it directly affects how the Federal Circuit is to review a district court's claim construction on appeal. 52 F.3d at 989 (Mayer, J., concurring).

The Federal Circuit majority in *Markman* held that claim construction is purely a matter of law, reviewed *de novo* on appeal, and considered that there are no underlying or subsidiary findings of fact as to which deference must be given. 52 F.3d at 976-79. Accordingly, the court of appeals now routinely accords no deference to any aspect of the trial judge's claim construction determination and will continue to do so in the absence of Supreme Court review. As the court made clear in *Exxon Chem. Patents, Inc. v. Lubrizol Corp.*, 64 F.3d 1553, 1556 (Fed. Cir. 1995), *cert. denied*, 116 S. Ct. 2554 (1996), "[n]o matter when or how a judge performs the *Markman* task, on appeal we review the issue of claim interpretation independently without deference to the trial judge." *See also Hoechst Celanese Corp. v. BP Chem. Ltd.*, 78 F.3d 1575, 1578 (Fed. Cir.) (under *Markman* the Federal Circuit decides "disputed questions of claim interpretation without deference to the trier of fact"), *cert. denied*, 65 U.S.L.W. 3265 (U.S. 1996); *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 72 F.3d 857, 863 (Fed. Cir. 1995) (the Federal Circuit engages in "independent determination of the construction of claims, as a matter of law, unencumbered by the trial process"). The court of appeals followed that routine practice in the instant case.

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[10] *Cf.* 116 S. Ct. at 1393 n.10 ("Because we conclude that our precedent supports classifying the question [of claim construction] as one for the court, we need not decide ... the extent to which the Seventh Amendment can be said to have crystallized a law/fact distinction.").

The Federal Circuit's "no deference" approach has engendered contention in the trial court-appellate court relationship. District court judges have expressed concern that the standard of review employed by the court of appeals has effectively rendered the fact finding in which they regularly engage in construing patent claims a pointless exercise, thus diminishing their role in patent infringement actions. In *Lucas-Aerospace, Ltd. v. Unison Indus., L.P.*, 890 F. Supp. 329 (D. Del. 1995), District Judge Schwartz criticized as unrealistic the Federal Circuit's disinclination to acknowledge that trial courts make factual findings based on extrinsic evidence as a vital and integral part of the claim interpretation process:

> If those possessed of a higher commission wish to rely on a cold written record and engage in *de novo* review of all claim constructions, that is their privilege. But when the Federal Circuit Court of Appeals states that the trial court does not do something that the trial court does and must do to perform [its] judicial function, that court knowingly enters a land of sophistry and fiction. [*Id.* at 333-34 n.7.]

See also Elf Atochem North Am. Inc. v. Libbey-Owens Ford Co., 37 U.S.P.Q.2d 1065, 1074-75 (D. Del. 1995) (District Judge McKelvie positing that the Federal Circuit's *de novo* review of claim construction will upset the ability of trial courts to efficiently administer patent trials). The acute concern and criticism of district court judges strongly signals the need for this Court's supervision and review of the Federal Circuit's claim construction practice.

In addition, the Federal Circuit's implementation of *de novo* review is a burden on judicial efficiency and is unfair to litigants who invest heavily in the district court's trial process of receiving evidence and assessing claim construction, only

to have the decision ignored by the appellate court. Rather than fulfilling our legal system's commitment to the trial as the "main event," *Wainwright v. Sykes*, 433 U.S. 72, 90 (1977), the Federal Circuit has elevated the appeal to the principal arena for resolving all aspects of claim construction. And given the decisive role of claim interpretation, parties must now look to the appellate forum in most patent cases, markedly increasing the already high cost of patent litigation, and diminishing the prospects for settlements at the district court level.

For these reasons, it is evident that the Federal Circuit's claim construction practice presents an important issue affecting efficient and economical judicial procedure in patent infringement litigation and the public interest that is on par with, if not greater than, the claim construction issue presented by the *Markman* case.

II. The Federal Circuit's Practice Is in Conflict with Supreme Court Precedent

In *Markman*, this Court recognized that claim construction presents a mixed issue that "falls somewhere between a pristine legal standard and a simple historical fact." *Id.* at 1395 (quoting *Miller v. Fenton*, 474 U.S. 104, 114 (1985)); *see also Gasperini v. Center for Humanities, Inc* , 116 S. Ct. 2211, 2227 (1996) (Stevens, J., dissenting) (recognizing *Markman* as involving a mixed question of law and fact).[11] Acknowledging that neither history nor precedent

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[11] Thus, contrary to the prevailing view at the Federal Circuit, this Court did not hold claim construction to be a pure question of law. *Markman* has been interpreted by a minority of Federal Circuit judges as treating patent claim construction as a *mixed* question of fact and law. *Metaullics Sys. Co. v. Cooper*, No. 96-1290 (Fed. Cir. Nov. 15, 1996) (Mayer, J.); *Weiner v. NEC Elec., Inc.*, No. 96-1052 (Fed. Cir. Dec. 6, 1996) (Rader, J.).

provide "clear answers" regarding the factual and legal nature of claim construction in patent infringement litigation, the Court examined functional considerations in allocating that "mongrel practice" as between judge and jury. 116 S. Ct. at 1390, 1393. This functional analysis applies as well in determining the respective roles of the trial court and the court of appeals in the claim construction process.

Specifically, the Court has held that "deferential review of mixed questions of law and fact is warranted when it appears that the district court is 'better positioned' than the appellate court to decide the issue in question or that probing appellate scrutiny will not contribute to the clarity of legaldoctrine." *Salve Regina College v. Russell*, 499 U.S. 225, 233 (1991). Furthermore, "the reviewing attitude that a court of appeals takes toward a district court decision should depend upon the respective institutional advantages of trial and appellate courts." *First Options of Chicago, Inc. v. Kaplan*, 115 S. Ct. 1920, 1926 (1995) (citation and internal quotes omitted).

In the case of patent trials, the trial judge, as the principal receiver and evaluator of the evidence, is better positioned to assess the meaning of terms used in patent claims than is the court of appeals. *See Cooter & Gell v. Hartmarx Corp.*, 496 U.S. 384, 402 (1990) ("Familiar with the issues and the litigants, the district court is better situated than the court of appeals to marshal the pertinent facts and apply the fact-dependent legal standard."); *see also Ornelas v. United States*, 116 S. Ct. 1657, 1664 (Scalia, J., dissenting) ("An appellate court never has the benefit of the district court's intimate familiarity with the details of the case--nor the full benefit of its hearing of the live testimony."). Indeed, a trial judge often will take live testimony from technical and legal experts as well as the inventor, and assess the credibility and

demeanor of those witnesses. This Court has recognized the probative value of the inventor's testimony in understanding the meaning of claims defining his or her invention. *See United Carbon Co. v. Binney Co.*, 317 U.S. 228, 233 (1942) ("The clearest exposition of the significance which the terms employed in the claims had for those skilled in the art was given by the testimony of . . . one of the patentees."). The trial judge is also likely to draw factual inferences from "physical or documentary evidence or . . . other facts" in the course of reaching its determination. *See Anderson v. City of Bessemer City*, 470 U.S. 564, 574 (1985). Here, the trial court not only had testimony and documentary evidence, but actually was able to visit the railcars at issue.

By contrast, the ability of the court of appeals to determine what a patent claim means is hindered by the inherently limited nature of the appellate record. "Appellate briefs and fifteen minutes per side of attorney argument are not designed for *de novo* findings of disputed technologic questions." *Markman*, 52 F.3d at 999 (Newman, J., dissenting). Moreover, "[d]uplication of the trial judge's efforts on appeal would very likely contribute only negligibly to the accuracy of fact determination at a huge cost in diversion of judicial resources." *Anderson*, 470 U.S. at 575. In view of the institutional limits of appellate courts, the Court has recognized that independent review of mixed questions still requires the reviewing court to "take care both to review findings of historical fact only for clear error and to give due weight to inferences drawn from those facts by [trial] judges." *Ornelas v. United States*, 116 S. Ct. 1657, 1663 (1996); *see also Gasperini*, 116 S. Ct. at 2227 (Stevens, J., dissenting) ("mixed questions require courts to construe all record inferences in favor of the fact finder's decision and then to determine whether, on the facts as found below, the legal standard has been met").

Contrary to the Federal Circuit's practice, absent clear error, it is the trial court that determines the facts in mixed fact/law questions. Such deference to the trial court, however, does not preclude independent appellate review. *See Baumgartner v. United States*, 322 U.S. 665, 671 (1944). Consistent with Supreme Court precedent, mixed questions of law and fact warrant independent or "*de novo*" review without sacrificing the deference properly due the findings of the trial court underlying its claim construction. Under the *de novo* standard, appellate review "should proceed like review of any other district court decision," *i.e.*, by exercising plenary review over the trial court's legal conclusions and accepting findings of fact that are not clearly erroneous. *Kaplan*, 115 S. Ct. at 1926; *see also Markman*, 52 F.2d at 991 (Mayer, J., concurring) (noting that "any facts found in the course of interpreting the claims must be subject to the same standard by which we review any other factual determinations: for clear error in facts found by a court"). This bifurcated or split review permits the court of appeals to freely review legal conclusions but at the same time allows appropriate deference on questions for which its position is inferior. 1 Steven Alan Childress and Martha S. Davis, *Federal Standards of Review* § 2.19 (2d ed. 1992).

The Federal Circuit's routine practice of denying deference even to underlying facts in claim construction, such as the ordinary meanings of technical terms, is contrary to this Court's announced principle of deferring on fact findings in mixed questions of fact and law. It essentially obliterates the trial court's role in claim construction along with the types of evidentiary evaluation in which district court judges, as opposed to appellate court judges, regularly engage. Hence, the Federal Circuit's practice plainly obstructs the proper allocation of judicial resources that the Court's principle of deference in mixed fact/law questions seeks to secure.

This case exemplifies the consequence of the Federal Circuit's failure to accord due deference to trial court findings of fact. While the Court has "long noted the difficulty of distinguishing between legal and factual issues,"[12] it also has long recognized that patent claim construction lends itself to a number of basic factual inquiries, *viz.*, (i) what is the structure or device, described by the patentee, as embodying his invention; (ii) what mode of operation is introduced and employed by this structure or device; (iii) what result is attained by means of this mode of operation; and (iv) does the specification of claim cover the described mode of operation by which the result is attained? *Winans v. Denmead*, 56 U.S. (15 How.) 330, 338-39 (1853).

These are factors that the trial court here examined *en route* to its interpretation of the term "adjacent" in the context of the patent claim language. The trial judge made specific findings regarding the structure described in the patent, the mode of operation it embodied, and the practical result obtained in light of the claim language, specification and drawings of the '876 patent itself, as well as extrinsic evidence, including the testimony of witnesses and his own personal inspection of a physical embodiment of the claimed railcar.

For example, the trial court found that the ordinary meaning of "adjacent" is "not far off." The court also found that by being "adjacent" or "not far off" from the walls of the railcar, the claimed openings or vents facilitated the passage of sublimating CO_2 gas along the walls and into the cargo area. The court determined in view of such findings that the endmost openings in the accused GATC Arcticar are physically near

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[12] *Cooter*, 496 U.S. at 401; *see also Miller*, 474 U.S. at 113 ("the appropriate methodology for distinguishing questions of fact from questions of law has been, to say the least, elusive.").

enough to the end walls to provide the function required by the patent claims, and thus are "adjacent" to the end walls.

Under Rule 52(a) and this Court's precedent, including *Markman*, *Salve Regina*, *Ornelas*, and *Kaplan*, the Federal Circuit was bound to review the trial court's *Winans* fact findings for clear error. But by starting afresh to make its own claim construction without any deference accorded to the trial judge's findings, the Federal Circuit reached the result that the endmost openings in the accused Arcticar cannot be adjacent to the end walls as a matter of law, even though they achieve what the patent claim requires and sit less than three feet from the end walls of a railcar nearly 68 feet long. Had the appellate court given due deference to the district court's underlying findings of fact, it should have, and likely would have, affirmed the finding of infringement. *See* App. 13a-14a.

Virtually all patent infringement cases, like the one at issue here, involve claim construction, decided in the first instance by the district court judge. Until this Court undertakes review of the proper role of the court of appeals on the issue of claim construction, the Federal Circuit will continue to render worthless the substantial investment by litigants and the trial judge in effectuating the *Markman* mandate, essentially taking on to itself the entire analytical claim construction process of finding facts and drawing the legal conclusion thereon. Petitioner respectfully submits that this is an inefficient and unfair procedure for resolving the critical issue in patent infringement and is contrary to the proper appellate authority that the Federal Circuit should exercise under this Court's precedent. This case affords the Court a timely opportunity to clarify the correct appellate review standard applicable to a trial judge's claim construction--an issue conspicuously left open in *Markman*.

CONCLUSION

For the reasons stated above, the petition for a writ of certiorari should be granted.

Respectfully submitted,

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January, 1997

APPENDIX

United States Court of Appeals for the Federal Circuit

No. 95-1531

GENERAL AMERICAN TRANSPORTATION CORPORATION
Plaintiff-Appellant,

v.

CRYO-TRANS, INCORPORATED,
Defendant-Appellee.

Aug. 14, 1996

Rehearing Denied; Suggestion for Rehearing In Banc Declined
Oct. 10, 1996

Competitor brought declaratory judgment action against patentee, seeking declaration that its cryogenic refrigerated railcar did not infringe patent, and patentee filed infringement counterclaim. The United States District Court for the Northern District of Illinois, Ruben Castillo, J., 893 F.Supp. 774, ruled that patent was valid and that competitor's railcar was infringing. Competitor appealed. The Court of Appeals, Lourie, Circuit Judge, held that: (1) competitor's cryogenic railcar with carbon dioxide vent openings at ends of sidewalls did not infringe patent claiming vent openings "adjacent" to sidewalls and end walls, and (2) competitor's railcar did not infringe patent under doctrine of equivalents.

Affirmed in part and reversed in part.

Mayer, Circuit Judge, filed dissenting opinion.

Kenneth J. Jurek, McDermott, Will & Emery, Chicago, Illinois, argued, for plaintiff-appellant. With him on the brief was Rosanne J. Faraci.

Bruce A. Kaser, Miller, Nash, Wiener, Hager & Carlsen, Seattle, Washington, argued, for defendant-appellee. With him on the brief was James P. Donohue.

Before MAYER, LOURIE, and SCHALL, Circuit Judges.

LOURIE, Circuit Judge.

General American Transportation Corp. ("GATC") appeals from the judgment of the United States District Court for the Northern District of Illinois in which the court held GATC liable for patent infringement, awarded Cryo-Trans, Inc. $8,983,440 in damages, and entered a permanent injunction against GATC. *General Am. Transp. Corp. v. Cryo-Trans, Inc.*, 897 F.Supp. 1121 (N.D.Ill.1995); *General Am. Transp. Corp. v. Cryo-Trans, Inc.*, 893 F.Supp. 774 (N.D.Ill.1995). Because the court correctly held that the patent was not proved invalid, but misconstrued the claims and clearly erred in finding infringement, we affirm in part and reverse in part.

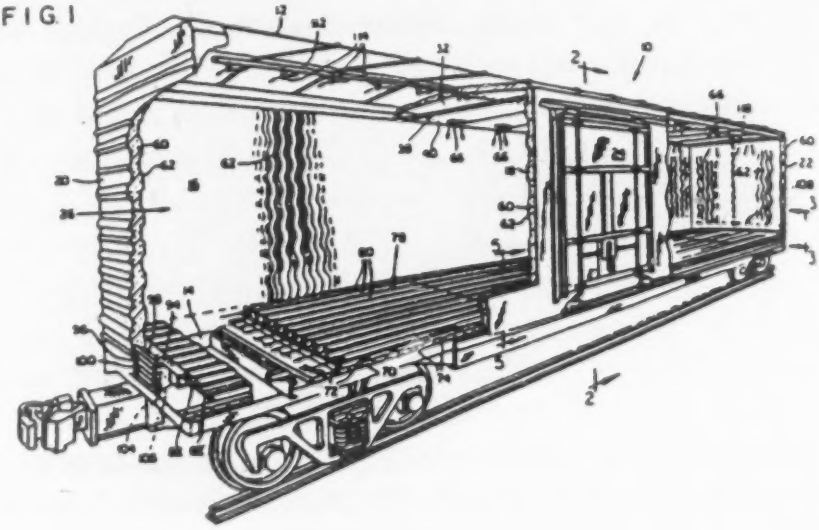
BACKGROUND

Cryo-Trans is the assignee of U.S. Patent 4,704,876, which concerns a "cryogenic" railcar for transporting frozen foods. Cryogenic railcars use inexpensive carbon dioxide (CO_2) as the refrigerant. Conventional refrigerated railcars, on the other hand, employ mechanical refrigeration systems that consume fossil fuels and thus are more expensive to operate.

The cryogenic railcar disclosed in the '876 patent has an insulated compartment (32) extending lengthwise along the top of the car. A system is provided for filling the compartment

with solid carbon dioxide "snow" by injecting liquid CO_2 into the compartment under high pressure. The bottom of the compartment contains openings (66) adjacent to each of the car's side walls (16, 18) and end walls (20, 22). In operation, the compartment is first filled with CO_2 snow and then the frozen food products are loaded into the cargo area (26). During transit, the CO_2 snow gradually sublimates as CO_2 gas, which flows through the compartment's openings (66) and moves downward along the side walls and end walls, enveloping and cooling the load. Each of the four walls has corrugated channels to facilitate the flow of the CO_2 gas down that particular wall. Figure 1 of the patent illustrates the railcar:

FIG. 1



Claim 1 is representative of the asserted claims. It reads, with emphasis on the language in dispute, as follows:

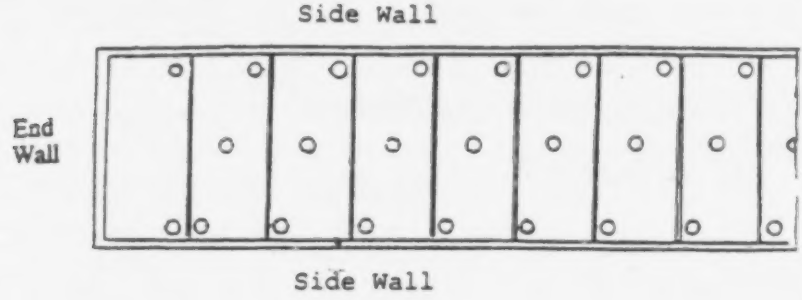
1. In a container adapted to be maintained in a refrigerated condition from the sublimation of carbon dioxide snow[,] the combination comprising: a storage area defined by a floor, a pair

of opposed side walls, a pair of opposed end walls, and a ceiling means; an insulated roof positioned above said ceiling means and defining therewith a compartment for supporting a supply of carbon dioxide snow, said compartment extending substantially the full length of said storage area; means in said compartment for forming carbon dioxide snow and means for connecting said carbon dioxide snow forming means to a supply of liquid carbon dioxide; *a plurality of openings through said ceiling means adjacent [sic] each of said side walls* and end walls for permitting the flow of sublimated carbon dioxide gas from said compartment; each of said walls being corrugated to define a plurality of channels therein open-sided toward the interior of the container whereby said carbon dioxide gas may flow from said openings in said ceiling means downwardly through said channels between said walls and a product load disposed in said container toward said floor.

Numerous cryogenic railcars were known before the invention at issue here. The "AFFX 2000" railcar, for example, which was built and publicly used in 1983, embodied all the elements of claim 1 except that its compartment for holding CO_2 snow had openings adjacent to only *one* side wall and it had no openings adjacent to the end walls. U.K. Patent 399,678, issued to Kurth in 1933, disclosed a cryogenic railcar in which a compartment for holding solid CO_2 had openings adjacent to both side walls, but again had no openings adjacent to the end walls. It also had no corrugated walls or system for forming CO_2 snow using liquid CO_2 .

GATC manufactured a cryogenic railcar that included a compartment for holding CO_2 snow. The bottom of the compartment had a row of openings provided lengthwise along its center and two rows of openings adjacent to the car's opposite side walls. The openings adjacent to the side walls were each three inches from the nearest side wall, and the

endmost of such openings were three feet from the nearest end wall. The endmost center row openings were six feet from the nearest end wall. The drawing below illustrates the arrangement of openings in GATC's railcar compartment:



In March 1991, after Cryo-Trans threatened to assert the '876 patent against GATC, GATC sued Cryo-Trans seeking, *inter alia*, a declaratory judgment that the patent was invalid, unenforceable, and not infringed. GATC argued that it did not infringe because the bottom of the compartment in its railcar lacked openings adjacent to the car's end walls, as required by the claims. Cryo- Trans counterclaimed for infringement of claims 1-3.

The district court conducted a bench trial in May 1995. At the conclusion of the trial, the court, relying on a dictionary definition, construed the term "adjacent" in the claims to mean "not far off" or "not necessarily at but nearby or near." The court then found that the endmost openings adjacent to the side walls in GATC's railcar compartment were "not far" from the car's end walls and functioned as openings adjacent to the end walls. Thus, the court found that GATC had infringed the claims, both literally and under the doctrine of equivalents. It rejected GATC's invalidity and unenforceability claims. The

court accordingly awarded Cryo-Trans $8,983,440 in damages and entered a permanent injunction.

GATC appeals, challenging the district court's findings that the '876 patent was infringed and not proved invalid. GATC does not appeal the court's decision rejecting GATC's unenforceability claim.

DISCUSSION

A. *Infringement*

Determining whether a patent claim has been infringed requires a two-step analysis: "First, the claim must be properly construed to determine its scope and meaning. Second, the claim as properly construed must be compared to the accused device or process." *Carroll Touch, Inc. v. Electro Mechanical Sys., Inc.*, 15 F.3d 1573, 1576, 27 USPQ2d 1836, 1839 (Fed.Cir.1993). Claim construction is a question of law, reviewed *de novo* on appeal. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979, 34 USPQ2d 1321, 1329 (Fed.Cir.1995) (in banc), *aff'd*, ___ U.S. ___ , 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996). The application of the claim to the accused device is a question of fact, reviewed for clear error. *Mannesmann Demag Corp. v. Engineered Metal Prods. Co.*, 793 F.2d 1279, 1282, 230 USPQ 45, 46 (Fed.Cir.1986).

GATC argues that the district court misconstrued the claim language "openings through said ceiling means adjacent to each of said side walls and end walls," which led to a clearly erroneous finding of infringement. We agree. As explained below, the district court incorrectly held that openings "adjacent" to the side walls could also be considered to be openings "adjacent" to the end walls. That error led to a clearly erroneous finding of infringement.

To ascertain the meaning of the claims, we consider the claim language, the specification, and the prosecution history. *Markman*, 52 F.3d at 979, 34 USPQ2d at 1329. Here, the claim language itself distinguishes between the openings that are adjacent to the side walls and those that are adjacent to the end walls. Specifically, the claims require "openings ... adjacent *each of* said side walls and end walls," which suggests that the openings adjacent to the side walls are structurally distinct from the openings adjacent to the end walls. The district court's claim construction obliterated that distinction.

In addition, the patent specification distinguishes between the openings that are adjacent to the side walls and those that are adjacent to the end walls. It states, in the "Summary of the Invention" section, that "[t]he bottom of the compartment is provided with openings *along each side and end wall* of the car through which sublimating carbon dioxide gas may escape." Col. 2, ll. 22-25 (emphasis added). Similarly, the "Detailed Description of the Invention" portion of the specification states:

> The bottom wall 40 of the compartment 32 is provided with a plurality of openings 66 *along each of the side walls 16, 18 and along each end wall 20, 22 of the car* and which openings are preferably slanted *toward the adjacent wall*. These openings are provided for the flow of carbon dioxide gas sublimating from the snow contained within the compartment 32 and which *gas may then flow downwardly along the adjacent wall* through the sinusoidal passageways defined thereby. The openings on opposite walls preferably are offset with respect to each other.

Col. 3, ll. 41-51 (emphasis added). This arrangement of openings is said to yield an advantage: "[B]ecause the cold *carbon dioxide gas is flowing downwardly on each of the opposite sides and on the ends of the car* and in direct contact

with the bottom of the load, all parts of the load will be maintained at a desirably low temperature." Col. 5, ll. 59-64 (emphasis added). Figure 1, to which the detailed description refers, depicts separate openings (66) adjacent to each of the side and end walls. Carbon dioxide gas is shown exiting each opening and travelling down the nearest wall.

Thus, the specification and drawings teach that the openings are provided along all four walls, and that each opening directs the flow of CO_2 gas down a particular, "adjacent" wall, *i.e.*, the nearest wall. This is not just the preferred embodiment of the invention; it is the *only* one described. Nothing in the claim language, specification, or drawings suggests that any of the dedicated side or end wall openings may be eliminated, or that an opening may be "adjacent" to more than one wall. The prosecution history is brief and not helpful to resolving the meaning of the disputed claim language.

Under these circumstances, we construe the phrase "openings ... adjacent each of said side walls and end walls" as referring to structurally distinct openings that are provided adjacent to each of the railcar's four walls. Each opening is "adjacent" to only one wall, the nearest one to which it directs the downward flow of CO_2 gas. Thus, an opening "adjacent" to a side wall cannot also be an opening "adjacent" to an end wall. The patent does not contemplate the openings performing double duty in this manner. We therefore reject the district court's claim construction, which was inconsistent with the specification and drawings and rendered superfluous the claim requirement for openings adjacent to the end walls.

In GATC's railcar, the openings were all closest to and thus "adjacent" to the *side* walls. The endmost openings are in fact twelve times the distance to the end walls compared with their distance to the side walls. The car lacked "a plurality of openings ... adjacent each of said ... end walls," as required by

the properly construed claims. We therefore hold that the district court clearly erred in finding literal infringement of claim 1 and dependent claims 2-3. *See Johnston v. IVAC Corp.*, 885 F.2d 1574, 1580, 12 USPQ2d 1382, 1386 (Fed.Cir.1989) ("Where a claim does not read on an accused device exactly, there can be no literal infringement."); *Mannesmann Demag Corp.*, 793 F.2d at 1282, 230 USPQ at 46 (literal infringement requires that every element of the patent claim be met).

Furthermore, the district court's finding of infringement under the doctrine of equivalents was also clearly erroneous, for two reasons. First, the finding violated the principle that the doctrine may not be used to expand the scope of the patentee's right to exclude so as to encompass the prior art. *E.g., Key Mfg. Group, Inc. v. Microdot, Inc.*, 925 F.2d 1444, 1449, 17 USPQ2d 1806, 1810 (Fed.Cir.1991). Here, the AFFX 2002 railcar had all the elements of claim 1 except that its compartment for holding CO_2 snow had openings adjacent to only one side wall and it had no openings adjacent to the end walls. This design was known to be deficient because "hot spots" (areas of thawing) tended to form in the cargo area opposite the side where the CO_2 gas was introduced. Clearly those of ordinary skill in the art would have known that insufficient CO_2 gas was reaching this area. Thus, it would have been obvious to more uniformly cool the entire cargo area by providing openings along both side walls. The Kurth patent, in fact, disclosed a cryogenic railcar in which the compartment for holding the solid CO_2 had openings adjacent to both side walls. The AFFX 2002 and Kurth railcars were in the same field of endeavor as the claimed invention and were properly combinable prior art. The Kurth patent was not before the PTO during the prosecution of the '876 patent.

We are therefore convinced that the prior art fairly suggested a cryogenic railcar having the combination of features

present in GATC's railcar, including a compartment having openings adjacent to both of the car's side walls. Thus, since allowing the claims to encompass GATC's car would cause the claims to cover subject matter obvious over the prior art, the car cannot be held to infringe the '876 patent under the doctrine of equivalents. *See Wilson Sporting Goods Co. v. David Geoffrey & Assocs.*, 904 F.2d 677, 14 USPQ2d 1942 (Fed.Cir.), *cert. denied*, 498 U.S. 992, 111 S.Ct. 537, 112 L.Ed.2d 547 (1990). As we stated in *Wilson Sporting Goods*:

> [A] patentee should not be able to obtain, under the doctrine of equivalents, coverage which he could not lawfully have obtained from the PTO by literal claims. The doctrine of equivalents exists to prevent a fraud on a patent, *not* to give a patentee something which he could not lawfully have obtained from the PTO had he tried. Thus, since prior art always limits what an inventor could have claimed, it limits the range of permissible equivalents of a claim.

Id. at 684, 904 F.2d 677, 14 USPQ2d at 1948 (citation omitted); see also *Stewart-Warner Corp. v. City of Pontiac, Michigan*, 767 F.2d 1563, 1572, 226 USPQ 676, 682 (Fed.Cir.1985) (there can be no infringement under the doctrine when "the asserted range [of equivalents] would encompass the prior art at the very point at which the ... claims distinguish from that prior art").

Second, the district court's finding of infringement under the doctrine of equivalents was clearly erroneous because "[t]here can be no infringement as a matter of law if a claim limitation is totally missing from the accused device." *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1539, 20 USPQ2d 1456, 1459 (Fed.Cir.1991). GATC's railcar had no openings adjacent to the end walls, as required by the claims, nor did GATC substitute an equivalent structure. Cryo-Trans argues that its expert testified that "the end-most vents of the *center* row will

provide a substitute for any ceiling vents eliminated by GATC." We disagree with Cryo-Trans that each of the endmost center row openings, located six feet from the nearest end wall, was equivalent to a "plurality" of openings adjacent to the end walls. They are much further from the end walls than the endmost openings in the side walls, which we have held do not satisfy the claim limitation. Thus, because the accused device lacked an equivalent to "a plurality of openings ... adjacent each of said ... end walls," there was no infringement under the doctrine of equivalents. *See London*, 946 F.2d at 1539, 20 USPQ2d at 1459; *Pennwalt Corp. v. Durand- Wayland, Inc.*, 833 F.2d 931, 937, 4 USPQ2d 1737, 1741 (Fed.Cir.1987) (in banc) ("A device that does not satisfy [a] limitation at least equivalently does not function in substantially the same way as the claimed invention."), *cert. denied*, 485 U.S. 961, 108 S.Ct. 1226, 99 L.Ed.2d 426 (1988); *Perkin- Elmer Corp. v. Westinghouse Elec. Corp.*, 822 F.2d 1528, 1532, 3 USPQ2d 1321, 1324 (Fed.Cir.1987) (courts may not "convert a multi-limitation claim to one of [fewer] limitations to support a finding of equivalency").

Accordingly, we reverse the district court's findings of literal infringement and infringement under the doctrine of equivalents.

B. *Validity*

GATC argues that "[i]f the district court's claim construction is correct, then the '876 Patent is invalid" under 35 U.S.C. §§ 102 and 103. GATC contends, *inter alia*, that if claim 1 were construed to cover a railcar that had no openings adjacent to the end walls, the combination of the AFFX 2002 railcar with the Kurth patent would render the claim invalid for obviousness.

We have agreed with GATC, however, that the district court's claim construction was not correct. Thus, its obviousness argument directed to that claim construction is no longer pertinent. GATC has not argued or established that the prior art would have rendered obvious a cryogenic railcar having a compartment that included openings adjacent to *all four* walls, as required by the properly construed claims. We decline to speculate whether it would have been obvious to those of ordinary skill in the art to modify the AFFX 2002/Kurth railcar by adding openings adjacent to the end walls. Thus, the district court did not clearly err in concluding that GATC did not prove invalidity by clear and convincing evidence.

We have considered the parties' remaining arguments but find them either unpersuasive or unnecessary for resolution of the appeal. Among these arguments is GATC's claim of prior invention by James Moe and Tom Maxwell. Moreover, in view of our conclusion concerning infringement, we must vacate the award of damages and the permanent injunction. GATC's arguments concerning the correctness of the damages award are therefore moot.

CONCLUSION

The district court erred as a matter of law in construing the claims and clearly erred in finding infringement. Accordingly, the court's decision finding infringement, awarding damages, and entering a permanent injunction is reversed. Its conclusion concerning validity is affirmed.

COSTS

No costs.

AFFIRMED-IN-PART AND REVERSED-IN-PART.

MAYER, Circuit Judge, dissenting.

The district court correctly construed the only claim limitation in dispute: "[T]he term 'adjacent' as used in the '876 patent means 'not far off.'" The court then found that the openings nearest the end walls of General American Transportation Corporation's (GATC) accused railcar were "adjacent" to those walls and therefore literally infringed the claim. I see no error in claim construction or in the finding of infringement.

Claim limitations "will be given their ordinary meaning, unless it appears that the inventor used them differently." *ZMI Corp. v. Cardiac Resuscitator Corp.*, 844 F.2d 1576, 1579 (Fed.Cir.1988). This court's citations to the claim language and specification to support a meaning other than the ordinary meaning of "adjacent" are misplaced. The claims do require openings adjacent to both end walls and side walls, but they do not define how close to the wall those openings must be to be considered adjacent. Nor do the claims require an opening to be closer to one wall than another to be considered adjacent to a particular wall. The only hint that an opening should be configured in a specific manner comes in a discussion of the inventor's preferred embodiment. Although we construe claims in light of the specification, we do not import the specification wholesale into the claims. *Intervet Am., Inc. v. Kee-Vet Lab., Inc.*, 887 F.2d 1050, 1053, 12 USPQ2d 1474, 1476 (Fed.Cir.1989). It is improper to read the inventor's preferred arrangement as a claim limitation here.

This court's *de novo* claim construction would necessarily prevent a finding of infringement whenever a vent is nearer a side wall than an end wall. This cannot be. For example, a vent only an inch away from an end wall will not be considered "adjacent" to the end wall as long as the vent is less than an inch from a side wall. Given the dimensions at issue, surely a vent

such a short distance from an end wall is "adjacent" to that wall and must be infringing. The difference between this hypothetical and our case is only a matter of degree. The vent here was only 33 inches from the end wall of a railcar which is 812 inches long. The district court is in a much better position to evaluate this matter of degree.

The district court also correctly concluded that the claims were not obvious over the cited prior art, which it considered to include U.S. Patent No. 4,593,536 to Fink and Habel, the AFFX 2002 cryogenic railcar and variants thereof, U.S. Patent No. 3,561,226 to Rubin, and British Patent No. 399,678 to Kurth. It looked at the invention as whole and explicitly refused to "us[e] the patent or invention at issue as a guide to combine bits and pieces of earlier designs and then reach a conclusion of obviousness." *See Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed.Cir.1984) ("[T]he question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination."). The court concluded that "[t]here is no clear suggestion of combining different pieces of prior art to produce the invention claimed by the '876 Patent unless the patent is improperly used as a guide to make the combination." Again, I find no error in the district court's analysis of the prior art or in its finding that there was no motivation to combine the cited references. It was mindful that "[c]are must be taken to avoid hindsight reconstruction by using 'the patent in suit as a guide through the maze of prior art references, combining the right references in the right way so as to achieve the result of the claims in suit.'" *Grain Processing Corp. v. American Maize-Prods. Co.*, 840 F.2d 902, 907, 5 USPQ2d 1788, 1792 (Fed.Cir.1988) (citing *Orthopedic Equip. Co. v. United States*, 702 F.2d 1005, 1012, 217 USPQ 193, 199 (Fed.Cir.1983)).

This court relies principally on a combination of the AFFX 2002 railcar, which admittedly disclosed many of the elements of the '876 patent claim, and the Kurth patent, which disclosed openings in a dry ice bunker adjacent to both side walls of a railcar. This combination requires the precise measure of hindsight that the district court refused to supply. The evidence at trial showed that no one really understood the gas flow cooling mechanism of the AFFX 2002 cryogenic design. The Fink patent, which is based on the AFFX 2002, disclosed a system in which CO_2 gas supposedly exited the overhead bunker, flowed by convection down one side of the car, traveled underneath the load in the car, and then recirculated back up the other side of the car. If that were true, a second row of vents on the opposite side of the car would not only have been unnecessary, but likely would have been detrimental to the cooling convection flow that was thought to exist. There was thus no motivation to include the Kurth patent which disclosed openings on the opposite side walls of a railcar bunker.

The 1933 Kurth patent also is directed to the loading and cradling of pre-made dry ice. There is no indication that "CO_2 snow" which subsequently sublimates is ever created in the bunker shown in Kurth, and the testimony at trial was that Kurth disclosed a "cold plate" bunker which simply provides a large cold surface for cooling the air in the lading compartment below. The extremely small number of vents disclosed in Kurth was unlikely to provide an adequate cooling mechanism for the sublimation of a bank of "CO_2 snow." Given this testimony, I believe the district court could readily conclude that Kurth operated in a fundamentally different way from the other cryogenic cars cited as prior art. Without motivation to combine Kurth, the only reference which disclosed openings on both sides of a bunker, with the AFFX 2002, whose method of heat transfer was at best uncertain, GATC failed to prove by clear and convincing evidence that the '876 patent is obvious.

The district court's analysis is bolstered by the secondary considerations of nonobviousness. The court found that Cryo-Trans' "'876 patent design has been accepted by the industry" and that it enjoys a high degree of commercial success. It also found that "[t]he '876 patent design solved a long felt transportation problem for frozen food processors, who were searching for a viable solution since 1980 to the poor economic and maintenance viability problem of old railroad mechanical cars."

The district court further found that in late 1990, GATC became aware of Cryo-Trans' commercially successful cryogenic railcar patent, and "decided it had to promptly get into the cryogenic railcar market and copy Cryo-Trans' high cube car." To this end, GATC obtained a copy of the original drawings of the Cryo-Trans car from the company which manufactured the railcar shell, and then moved the shell to a second manufacturer which completed the interior of the car along with identical cars that were being completed for Cryo-Trans.

GATC admitted that its original prototype infringed the '876 patent. After Cryo-Trans filed this suit, GATC merely blocked off several of the openings closest to the ends of its cars. At trial, one of GATC's own engineers admitted that the accused device did not work any differently than the admittedly infringing first prototype. The trial court was surely correct when it concluded that "GATC copied the design of the Cryo-Trans high cube car after the commercial viability of the technology was proven by Cryo-Trans." None of these findings are clearly erroneous.

The district court did not err in holding that the '876 patent "represents a significant improvement from the relevant prior art and is not obvious from a review of the relevant prior art." Eschewing the aid of hindsight to combine the cited references,

and with appropriate deference to the district court's factual findings, I would affirm the judgment in its entirety.

United States District Court,
N.D. Illinois, Eastern Division

No. 91 C 1305

GENERAL AMERICAN TRANSPORTATION CORPORATION
Plaintiff,

v.

CRYO-TRANS, INCORPORATED,
Defendant.

CRYO-TRANS, INCORPORATED,
Counterclaim-Plaintiff,

v.

GENERAL AMERICAN TRANSPORTATION CORPORATION
Counterclaim-Defendant.

July 14, 1995

Competitor brought declaratory judgment action against patentee, seeking declaration that its cryogenic refrigerated railcar did not infringe patent, and patentee filed infringement counterclaim. The District Court, Castillo, J., held that: (1) competitor's railcar infringed both literally and under doctrine of equivalents; (2) patent was not obvious in light of prior art; (3) patent was not invalid on grounds of inequitable conduct; (4) patentee was entitled to damage award of $9,705,172,

representing lost profits, price erosion and prejudgment interest; and (5) infringement of patent was not willful and case was not exceptional, so as to warrant award of attorneys' fees in favor of patentee.

Judgment accordingly.

Scott William Petersen, Thomas Irving Ross, Randall Thomas Erickson, Hill, Steadman & Simpson, Chicago, IL, for plaintiff General American Transp. Corp.

James P. Donohue, Bruce A. Kaser, Miller, Nash, Wiener, Hager & Carlsen, Seattle, WA, Kenneth E. Rechtoris, Carol Ann Genis, Bell, Boyd & Lloyd, Chicago, IL, for defendant Cryo-Trans, Inc.

MEMORANDUM OPINION AND ORDER

CASTILLO, District Judge.

Due to the continued fast pace of American life, the production of frozen food products has continually expanded during the last decade. Yet, because railroad carriers had not replaced aging mechanical refrigeration cars since the early 1970's, the American transportation system explored the feasibility of using liquid carbon dioxide ("CO_2") to create cryogenic railcar systems which could economically transport frozen food products. These developments led to the dispute in this case.

Beginning on May 1, 1995 and continuing through May 10, 1995, this Court held a bench trial on this matter. During this patent trial, this Court has been called upon to decide questions of patent validity and infringement concerning competing cryogenic refrigerated railcars. During the trial, the Court received testimony and documentary evidence and conducted a site visit to personally inspect and view the railcars at issue in this case. Thereafter, the Court considered the written post-trial

submissions filed by each party. The Court hereby enters the following Findings of Fact and Conclusions of Law, which in contrast to its prior order in this matter, are based upon consideration of all the admissible evidence as well as this Court's own assessment of the credibility of the trial witnesses. To the extent, if any, that the Findings of Fact as stated may be deemed Conclusions of Law, they shall be considered Conclusions of Law. Similarly, to the extent that matters expressed as Conclusions of Law may be deemed Findings of Fact, they shall also be considered Findings of Fact.

FINDINGS OF FACT

1. This case involves a patent dispute between General American Transportation Corporation and Cryo-Trans Inc.

2. Plaintiff General American Transportation Corporation ("GATC") is a corporation organized under the laws of New York, with its principal place of business in Chicago, Illinois.

3. Defendant Cryo-Trans, Inc. ("Cryo-Trans") is a corporation organized under the laws of Maryland, with its principal place of business in Mt. Airy, Maryland.

4. GATC's claim is an action for declaratory judgment, pursuant to 28 U.S.C. § 2201, with respect to the enforceability of United States Patent 4,704,876 ("the '876 Patent") against a cryogenic railcar produced and marketed by GATC. (Pl.'s Ex. A).

5. The '876 Patent is owned by Cryo-Trans which has counterclaimed for patent infringement pursuant to 35 U.S.C. § 281. Figure 1 of the '876 Patent is hereby incorporated into this opinion as Appendix A. (Pl.'s Ex. A).

6. Venue in this case is proper under 28 U.S.C. §§ 1391 and 1400(b) and jurisdiction is proper under 28 U.S.C. § 1338.

7. On March 1, 1991, GATC filed a four-count complaint against Cryo-Trans seeking a declaratory judgment that the '876 Patent, issued to Mr. Ralph P. Hill on November 10, 1987, and entitled "*Cryogenic Refrigeration System*", is invalid, void and unenforceable, and further that the '876 Patent is not infringed by GATC's cryogenic refrigerated boxcar design, presently commercialized in the United States under the tradename "Arcticar". The complaint also sought a preliminary injunction enjoining Cryo-Trans from threatening patent infringement and other related litigation against actual and prospective users of GATC Arcticar boxcars. The extensive procedural history of this case includes a five-day hearing held before Magistrate Judge Rosemond in July, 1991, on the parties' cross-motions for preliminary injunction. On August 12, 1994, Magistrate Judge Rosemond issued a formal Report and Recommendation which found in favor of GATC with respect to the issues raised before him in the parties' cross-motions for preliminary injunction.

8. This Court adopted the recommended findings in the Magistrate Judge's Report in a Memorandum Opinion dated December 20, 1994, which granted a preliminary injunction in favor of GATC, except that this Court rejected, as premature, Magistrate Judge Rosemond's recommendation that GATC's motion for attorney fees under 35 U.S.C. § 285 be granted. The Court's December 20, 1994 order expressly indicated that this Court had not made any final determinations on the merits of this case.

9. GATC has been in the business of leasing railcars to the railroad industry for approximately 80 years, and for many years with respect to the business of manufacturing and leasing mechanically refrigerated railcars. In late 1990, GATC introduced a prototype non-mechanical, cryogenically refrigerated railcar using a bunker-style design. This prototype cryogenic railcar was designated the GARX 68000, and was

built under the supervision of Mr. Erling Mowatt- Larssen, GATC's Director of Engineering. The GARX 68000 was built and used only for demonstration and marketing purposes to solicit orders from frozen food shippers for the company's anticipated production of a cryogenically refrigerated railcar called the "Arcticar." The prototype railcar has never been, and is not, available for lease by customers.

10. Around April of 1991, the GARX 68000 was modified several times to become the GATX production car design styled the "Arcticar." Thereafter, in November of 1991 GATC obtained United States Patent 5,168,717 which incorporated the modified design. Figure 1 from this patent is hereby incorporated into this opinion as Appendix B. (Def.'s Ex. 228). The primary modification was the blocking up of the openings in the bunker floor adjacent the end walls. As a result, the Arcticar production railcar has no openings adjacent the end walls of the car. In early 1991, GATC obtained its first order for Arcticar railcars.

11. Cryo-Trans is the owner by assignment of the '876 Patent. (Def.'s Ex. 139). In 1985, Mr. Marvin H. Weiner formed a sole proprietorship named "Cryo- Trans" for the purpose of developing a business involving the leasing of cryogenically refrigerated railcars. Cryo-Trans was incorporated to form Cryo- Trans, Inc. in 1987. Mr. Weiner is the chief executive officer and president of Cryo-Trans, Inc. Cryo-Trans' cryogenically refrigerated railcars are referred to as CRYX railcars. Mr. Weiner is also the president of Mt. Airy Cold Storage ("Mt. Airy"), a frozen food storage facility used by frozen food processors which is located in Mt. Airy, Maryland.

12. The declared inventor of the '876 Patent is Mr. Ralph P. Hill. Mr. Hill has not obtained other patents. (Tr. 118, 122).

13. At all relevant times prior to his retirement in 1988, Mr. Hill was vice president of distribution at Lamb-Weston, Inc. in Portland, Oregon. (Stip. No. 5). He was also a past chairman and long-time member of the American Frozen Food Institute's Physical Distribution Council. Mr. Hill is credited with having made many outstanding contributions in rail transportation of frozen foods.

14. A critical issue facing the frozen food industry in the 1980's was the availability of mechanical refrigerator cars owned by the nation's railroads. The then-current policy of the railroads was not to replace aging mechanically refrigerated railcars as they became unserviceable. The frozen food industry's dependence on mechanical refrigerator cars for long-haul movement was expected to be compounded by the continuing escalation of diesel fuel prices which would preclude long-haul truck movement and make the industry even more dependent on the railroads. Finding an alternative to the use of mechanical refrigerator cars had been a high priority matter for the American Frozen Food Institute Distribution Council and Transportation Committee since at least 1982.

15. The American Frozen Food Institute ("AFFI") and the International Association of Refrigerated Warehouses ("IARW") through the Refrigeration Research Foundation jointly formed a cryogenic railcar research and development task force (AFFI-IAWR Refrigerated Railcar Task Force) to explore the feasibility of using total loss refrigerants, such as liquid CO_2 to ensure an adequate transportation system for the expected growth of the frozen food industry. The United States Department of Agriculture provided the scientific monitoring and evaluation for the test shipments. Additionally, there was substantial resource involvement by the Burlington Northern Railroad.

16. Recognizing that the supply of mechanically refrigerated cars was steadily declining, Mr. Hill initiated the Cryogenic Rail Car Research Project. The project involved development of prototype railcars that relied on CO_2 , rather than mechanical systems, to provide refrigeration. Hill was a leading force behind the project.

17. Mr. Hill first initiated the Cryogenic Rail Car Research Project under the joint sponsorship of the AFFI and IARW, and later through a separately incorporated organization called the American Frozen Food Cryogenic Association for Rail Car Research--better known as AFFCAR--which was a non-profit shipper's association formed to purchase refrigerated railcars with which the AFFI cryogenic research and development task force could experiment. Hill was chairman and leader of AFFCAR throughout its existence. Throughout the Cryogenic Rail Car Research Project, Mr. Hill championed the need for research, raised funds, supervised the design, engineering and testing of prototype railcars, and kept the frozen food industry informed of the progress of the research. In 1985, he was recognized by the frozen food industry for his work in championing the need for cryogenic research, raising funds to build prototype cars, supervising design work, and engineering and testing prototype cars. (Def.'s Exs. 14, 22, 23, 30, 47, 233 ¶ 28, 234 PP 17-18, 235 PP 15, 16, 21).

18. During 1980-1985, AFFCAR and/or Burlington Northern built a number of prototype cryogenic cars which were identified as the BNFE 3, AFFX 2001, AFFX 2002 and AFFX 2003 during the trial.

19. The AFFI task force decided that an insulated railcar loaded with frozen food and given an initial charge of cryogen would most likely be a technically and economically feasible cooling system. A series of test shipments were conducted over a one year period to determine the feasibility of using CO_2 as an

alternative refrigeration source for railcar shipments of frozen foods. The Burlington Northern Railroad donated its modified mechanical refrigerator test car ("the BNFE 3") to be used in the AFFI cryogenic railcar project study. The BNFE 3 was a refrigerated railcar originally built as a meat car in 1966, and rebuilt with under-the-floor air delivery and a truck- type nosemount mechanical refrigeration unit in 1976. It was modified for CO_2 snow refrigeration in June of 1980. Seven shipments of various frozen commodities in the summer and fall of 1980 and the winter and spring of 1981 were made. The mechanical unit was not used during the testing. Upon evaluation of the test data from the BNFE 3 test shipments, the cryogenic railcar research task force concluded that the cryogenic refrigeration concept warranted further testing and consideration.

20. Ralph Hill, James Fink, Eddie Barron, LeRoy Couture and Bill McCollister were principally involved in the reconstruction of the BNFE 3 railcar in 1980. (Tr. 72). The BNFE 3 was a converted mechanical refrigeration car, which utilized an overhead rectangular manifold at the ceiling of the car to spray CO_2 directly on the load. It utilized a single loading of CO_2 at the place of embarkation. (Tr. 71-72). The BNFE 3 car proved that CO_2 had applications for use in transportation of frozen food, but had drawbacks which did not allow the entire load to remain consistently frozen during the entire trip. (Tr. 73).

21. With promising results from the BNFE 3 test shipments, the task force proceeded to plan and design the construction of a prototype cryogenic railcar with an on-board CO_2 temperature control system with no mechanical or electric parts; thus, eliminating costly mechanical diesel powered refrigeration. Construction of the prototype car--the AFFX 2001--was completed in January of 1983.

22. The AFFX 2001 car was built for AFFCAR as an attempted improvement over the BNFE 3 car. The AFFX 2001 utilized tanks of liquid CO_2 beneath the floor of the loading area to carry a supply of CO_2 on the railcar as well as a computer to sense temperature changes and to direct release of CO_2 snow on the load. (Tr. 81).

23. The salient features of the "*AFFX 2001–Prototype Car Design*" were as follows:

> The car is equipped with a liquid carbon dioxide refrigeration tank system. The system stores liquid carbon dioxide under pressure at zero degrees Fahrenheit in a series of interconnected aluminum storage tanks placed lengthwise to the car beneath the car's aluminum floor. The tank system not only provides in transit storage for liquid carbon dioxide, but also acts as a barrier to heat entering the car and functions as a giant cold plate to keep the load frozen.
>
> An initial blanket of carbon dioxide snow is deposited in the air on top and around the load prior to departure from the loading warehouse. While in transit, the load receives additional charges of snow triggered by a thermostatically controlled temperature sensor in the ceiling of the car above the air and load. Operation of the refrigeration system requires only pneumatic power provided by the pressure of the liquid carbon dioxide. No electrical nor diesel power is needed. The prototype car is the largest and best insulated refrigerator car ever built. The car utilizes state of the art compressed polyurethane foam in place insulation placed behind interior fiberglass roof and wall panels with specially designed deep corrugated channels to allow the free flow of carbon monoxide gas over and around the load of frozen food. The exterior of the car is painted with

> a high gloss reflective acrylic white paint specially formulized to maximize reflection of radiant heat from the sun to provide an exterior surface that can easily be cleaned.
>
> The prototype car has a capacity of 4,904 cubic feet, compared with the 4,050 cubic feet capacity of existing mechanical cars. The overall exterior length of the car is nearly 65 feet. The interior length is 58 feet.

As evident from the above-quoted description, the AFFX 2001 was equipped with an under-the-floor liquid CO_2 cooling system, corrugated paneling on the side walls, and a piping system with which to inject liquid CO_2 directly on top of the cargo to form CO_2 snow. The AFFX 2001 proved impractical because of the extra weight of the car from the storage tanks of liquid CO_2 and because the computers, which controlled the release of CO_2 while in transit, were subject to breakdown due to the difficulties of the rail environment. (Tr. 83).

24. Mr. Hill was part of a group of people who helped to design the AFFX 2001. Other persons involved in designing the AFFX 2001 included Messrs. Fink, Habel, Couture and Jenkins.

25. One of the problems with the AFFX 2001 Cryogenic Prototype Railcar Design was that direct contact of solid CO_2 with the frozen cargo caused over- freezing of the frozen food product near the top of the shipments. The solution to the problem was to put a bunker between the cargo and the solid CO_2 . Accordingly, in a subsequent phase of the task force's cryogenic railcar research, the Burlington Northern Railroad modified two existing large cube mechanical refrigerator cars with the Rubin Carbonaire Plate CO_2 Snow Bunker System. The two cars were called the AFFX 2002 and the AFFX 2003, and operated as follows:

> These cars are equipped with a snow bunker which consists of a sheet metal chamber across the interior ceiling of the car. Liquid CO_2 is charged under pressure to supply lines accessible from either side of the A end (end opposite the brake wheel end) to the overhead bunker. As the liquid CO_2 is charged into the non-pressurized atmosphere in the bunker, it converts to snow which accumulates in the bunker under the entire ceiling of the car. The under surface of the bunker, which is the interior ceiling of the car, is insulated to control the sublimation (melting) of the snow and prevents extreme cold air from reaching the product in the car. As the CO_2 sublimates, the cold air drops down the side walls and around the load. (CO_2 is 52% heavier than air.)

The AFFX 2002, which evolved over a two year period, utilized an overhead bunker to store the CO_2 snow after charging. (Tr. 856). The idea of using an overhead bunker was a result of collective discussions between Bill McCollister, James Fink, LeRoy Couture and Ralph Hill. (Def.'s Ex. 233 ¶ 18, Tr. 90).

The Burlington Northern took the AFFX 2002 and the AFFX 2003 back after the AFFCAR project and put both cars in their fleet, and built 75 additional such cars in the remaining part of 1985–after March of that year.

26. The AFFX 2002 was an experimental car. (Tr. 866). It went on two test runs before ratification (Tr. 838-39; Barron Dep. at 30-31). The AFFX 2002 design showed that an overhead bunker might be a useful innovation. Nevertheless, the AFFX 2002 still needed improvement. Improvement was made to the design of the exhaust vents and floors which were incorporated into the AFFX 2002 for subsequent test runs and into the AFFX 2003, which was identical to the AFFX 2002, except for its overall length. (Tr. 435; Def.'s Ex. 233 ¶ 15;

Habel Dep. at 145-46; Barron Dep. at 21). Mr. Fink was principally responsible for the design of the AFFX 2002. (Tr. 163).

27. The cryogenically refrigerated railcar designated AFFX 2002 was built by employees of the Burlington Northern in June-July of 1983. Burlington Northern sold the railcar to AFFCAR after its completion. (Tr. 165, 437). This railcar was used to transport frozen food product from the State of Washington to an unloading site near Kansas City, Kansas, in the summer of 1983. Ralph Hill was familiar with the AFFX 2002 railcar construction. (Stip. No. 2). He witnessed the loading, testing, and unloading of the AFFX 2002 in 1983 and understood its construction. (*Id.*). Ralph Hill publicly asserted that the technology was available for anyone in the trade to use. (Pl.'s Ex. HH).

28. The AFFX 2002 was a converted mechanical refrigerator car having corrugated side and end walls, aluminum floor racks, corner floor drains used as cargo area vents, and an overhead bunker. (Pl.'s Exs. DF; DF(A). The bunker had screened vents along one side and alternating CO_2 nozzles penetrating into the duct. (Pl.'s Exs. DF, DF(A), EO). The bottom wall of the air duct was insulated. (Pl.'s Ex. EO). The CO_2 nozzles were connected to a CO_2 manifold pipe running the length of the car and connectable to an outside source of liquid CO_2 . (Pl.'s Ex. DF, DF(A)). The aluminum floor racks were of a herringbone construction with spaced apart slats running obliquely transversely and supported by lengthwise stringers to support the load. (Pl.'s Ex. DF; DF(A)). The stringers formed a plurality of parallel lengthwise channels for allowing CO_2 gas to flow beneath the cargo. A center rail between the floor racks would make it difficult for CO_2 gas to flow side to side under the floor. (Pl.'s Exs. DF(A), DX; Tr. 821-822, 826, 859-860).

29. When the AFFX 2002 railcar was initially charged with CO_2 , the doors were kept ajar to relieve pressure. (Def.'s Ex. 233 ¶ 16, Barron Dep. at 32- 33). Although the drain vents at each of the corners of the AFFX 2002 railcar were kept open during the charging phase, most of the pressure was relieved through the open door. (Tr. 867, 1071-72; Barron Dep. at 32-34). If the door was not kept open, the roof of the car was in jeopardy of being blown off because the drain vents were not sufficient to relieve the pressure. (Tr. 446- 47).

30. There is a dispute as to how the sublimated CO_2 gas would flow in the AFFX 2002. Many of the people involved in developing the AFFX 2002, including Messrs. Hill, Couture, Habel and Barron, believed that its CO_2 gas would drop down the sidewall nearest the bunker toward the aluminum floor racks, pass through the gaps between the slots on the aluminum floor racks beneath the load, and then go up on the opposite sidewall of the car and over the top of the load. (Tr. 87-88; Def.'s. Ex. 233 ¶ 14; Tr. 445; Habel Dep. at 148; Barron Dep. at 18). Mr. Fink, who also was involved in the design of the AFFX 2002, however, believed that the gas would flow on top of the load and go down both sidewalls. (Tr. 849). This theory of gas flow is contrary to what is claimed as the gas flow in the Fink and Habel Patent. (Pl's. Ex DF; Tr. 858). While GATC's in-court demonstration was of interest in trying to determine through the use of a simulated model how the AFFX 2002 actually may have worked, (Pl.'s Ex. HK), it is not entitled to much weight because it does not answer the question of how the relevant persons in the art believed the AFFX 2002 worked during the relevant time period.

31. Mr. Hill was involved in providing input and design assistance for the BNFE 3, the AFFX 2001, and the AFFX 2002/2003 cars. (Tr. 22, 84, 90, 418-20, 425-26). The development of a successful cryogenic railcar was very much an

evolutionary process involving trial and error. Mr. Hill was the only person who was aware of everything that was going on in connection with AFFCAR activities. He was the only person actively involved in the development phase of each and every prototype car developed by AFFCAR. (Def.'s Ex. 234).

32. Each of the prototypes developed by AFFCAR and/or Burlington Northern had problems. However, by 1985, Burlington Northern began to commercialize the AFFX 2002/2003 design and built 75 railcars incorporating the AFFX 2003 design. Burlington Northern indicated to the industry that it was going to seek a patent. As a result, AFFCAR disbanded in March 1985. (Tr. 92-93).

33. At the time AFFCAR disbanded in March of 1985, Mr. Hill and his employer Lamb-Weston knew that there were problems with the AFFX 2002/2003 design. In particular, it was generally known that the car had hot spots along the sidewall opposite the bunker vents, were, resulting in the thawing of frozen product by the time it reached the east coast. Therefore, Lamb-Weston instructed Mr. Hill to continue working on the development of a successful cryogenic car. (Tr. 95-96).

34. Burlington Northern patented the AFFX 2002/2003 design. The patent issued as U.S. Patent No. 4,593,536 to two Burlington Northern employees, James K. Fink and David H. Habel ("Fink and Habel Patent"). (Pl.'s Ex. CQ; Tr. 92- 93). The Fink and Habel Patent specifically disclosed that "[w]hen the refrigerant flakes sublimate in the bunker, the vapor flows from the bunker out the screen mesh, down the channel of the first sidewall, across the air flow channel and up the channel of the second sidewall, all by convection." (Pl.'s Ex. CQ). Ultimately, Burlington Northern refurbished 75 cars utilizing a modified AFFX 2002/2003 design. These cars were not effective because they suffered from hot spots on the sidewall.

As a result, the Burlington Northern cars were never accepted in the marketplace, and ultimately were taken out of service. (Def.'s Ex. 233 ¶¶ 14-21).

35. The design that ultimately led to the '876 Patent was conceived by Mr. Hill during the summer of 1985. (Tr. 96; Def.'s Ex. 233 ¶ 22). During the summer of 1985, Mr. Hill spoke often to Mr. Jenkins, a fellow employee at Lamb-Weston, about how a CO_2 car should be designed. (Tr. 733-734). Mr. Hill often pulled out pieces of paper and made sketches. During the summer of 1985, Mr. Hill described a potential design for a CO_2 car to Mr. Jenkins which included a false ceiling created by the use of a bunker. (Tr. 737). During this same time period, Mr. Hill also described this idea to a Mr. LeRoy Couture, a marketing manager with the Burlington Northern. (Def.'s Ex. 233 ¶ 13). Mr. Hill's idea included use of vents along both sides of the ceiling bunker, as well as the use of corrugated walls on the end walls and the side walls and flooring of the car. (Tr. 754). (Def.'s Ex. 235). Mr. Jenkins also saw Mr. Hill with blueprints regarding this design. (*Id.*; Tr. 747-49). Blueprints, which reflected Mr. Hill's design, were prepared by Lamb-Weston's engineering draftsman during the summer of 1985. (Tr. 96).

36. Mr. Hill's employer, Lamb-Weston, was not interested in manufacturing railcars. It was interested in having someone else make them for Lamb-Weston's use. (Tr. 266).

37. Mr. Weiner knew Mr. Hill because of the business relationship between Mt. Airy and Lamb-Weston. Mr. Weiner was familiar with the Burlington Northern cryogenic railcars because they had been off-loaded at Mt. Airy. Because of this, he also knew that the Burlington Northern cars–AFFX 2001 and 2002 (which were the AFFCAR prototypes)–had "hot spots" resulting in a thawing of frozen food product by the time the cars reached Mt. Airy. (Tr. 252).

38. Mr. Weiner recognized the commercial potential of cryogenic railcars as a replacement to mechanical cars. Mr. Weiner and Mr. Hill agreed to work together to build a new prototype cryogenic railcar. Mr. Weiner agreed to fund the construction of a new prototype. (Tr. 253-54).

39. Mr. Weiner and Mr. Hill acquired and modified one of the AFFCAR prototypes, the AFFX 2001, into a new design. However, because the previously used construction facilities were no longer available, Messrs. Weiner and Hill had to find another party to do the modification work they desired. (Tr. 254).

40. Mr. Hill first met James S. Moe of C.V. Engineering in October of 1985. (Tr. 99; Stip. No. 3). At all relevant times, the company was commonly referred to simply as Cryo-Van, a company principally operated by James S. Moe and Tom Maxwell. Mr. Hill's initial meeting with Mr. Moe led him to believe that Cryo-Van had the capability of modifying the AFFX 2001 into his new design because Cryo-Van had the capability to manufacture fiberglass which was an important component of the new design. (Tr. 100-101).

41. In late 1984, James Moe, with the assistance of Tom Maxwell, designed and developed a cryogenically refrigerated "all purpose container" for the transport of frozen fish. Mr. Moe is a natural mechanic with cryogenic experience. His real expertise is in design and finding creative practical solutions to mechanical problems. The container included a bunker (or tray) extending the full length and width of the container to serve as a false ceiling above the fish cargo and upon which solid carbon dioxide was placed. The bunker served the same purpose as all bunkers holding refrigerants such as solid carbon dioxide, to-wit: to prevent direct contact of the refrigerant with the cargo below and, thus, avoiding overfreezing of the top of the load. Cryo-Van's bunker was formed with vent openings along the

side walls of the container to permit sublimated carbon dioxide gas to flow naturally down from the bunker to the cargo below.

42. In October of 1985, Mr. Hill sent blueprints of his design and of the original railcar which was to be converted into the new design (the AFFX 2001), to Cryo-Van. (Tr. 100). Mr. Moe ultimately threw away the blueprints sent to him by Mr. Hill. (Tr. 903). After receiving blueprints from Mr. Hill, C.V. Engineering submitted a bid to Mr. Hill in the amount of $22,150 by letter dated October 29, 1985. (Def.'s Ex. 21). This letter specifically acknowledges receipt of the blueprints from Mr. Hill and itemizes in detail the various changes requested by Mr. Hill for modification of the AFFX 2001 into the new design which ultimately became known as the CRYX 1000. (*Id.*) Mr. Moe acknowledged that Mr. Hill's prior designs included a bunker-type compartment. (Pl's Ex. HP at 690).

43. Cryo-Van converted the AFFX 2001 to the CRYX 1000. Although who actually designed the CRYX 1000 is not without some controversy, the evidence indicates that it is more likely than not that Mr. Hill principally designed the CRYX 1000.

44. The October 29, 1985 letter from Cryo-Van to Ralph Hill, while he was at Lamb Weston, Inc., confirms that the blueprints were sent to Cryo-Van by Mr. Hill. The first paragraph of the letter reads in pertinent part as follows:

> I [Tom Maxwell, General Manager of Cryo-Van] also thank you [Ralph Hill] very much for your prompt arrangement for expediting your blueprints on above matter. . . .

The Court specifically finds by a preponderance of the trial evidence that it is more likely than not that this language referred to blueprints of Mr. Hill's design.

45. The second full paragraph of the October 29, 1985 letter reads in pertinent part as follows:

> Pursuant to our recent discussion on refurbished rail car # 2001 to B[u]nker type rail car, we would like to offer you our proposal after carefully review [ing] your blue-prints as follows:
>
> * * * * * *
>
> 2. To remove existing end wall skins and install a vent from plenums to upper extremity of the end walls,
>
> 3. To make up and install a plenum at each end of the All-Air floor to connect to the vent to relieve the flash gas from the car at floor level, this insures that all the gas is used for cooling before being emitted to the outside,
>
> * * * * * *
>
> 5. To install Fluted fiberglass panels on the end walls,
>
> 6. To install bunker system designed and built by C.V. System Engineering, Inc.
>
> 7. To install a single centered CO_2 manifold designed and built by C.V. System Engineering, Inc. with load, test and bleed controls under the car at one end.
>
> * * * * * *
>
> 10. To remove the existing floor, tanks and grid work that now make up floor,
>
> 11. To build up from the sub-floor to the base for the All-Air floor,

12. To install an All-Air floor.

Although Cryo-Van helped to improve the original Hill design, this letter does not, contrary to GATC's position, indicate that Cryo-Van principally invented the CRYX 1000. Messrs. Moe and Maxwell used Mr. Hill's blueprints and the shell of the AFFX 2001 railcar to complete the construction of the CRYX 1000.

46. A December 10, 1985 letter from Mr. Marvin H. Weiner to Mr. M. Tom Maxwell, General Manager of C.V. System Engineering, Inc., states as follows:

> Dear Tom:
>
> You should by now have received AFFX 2001 (hereinafter referred to as CRYX 1000) for refurbishment. . . .

The body of this letter contains the following paragraph:

> It is also my understanding from Ralph [Hill] that he has discussed the matter of patent searches, clearances and indemnification with you. Indemnification should be for Lamb-Weston, Ralph and myself personally, Cryo- Trans and Mt. Airy Cold Storage.
>
> Based on the ultimate performance of CRYX 1000, we see this as the forerunner of mutually exciting times for all of us.

At the time of this letter, Messrs. Hill and Weiner were concerned that Cryo- Van's liquid CO_2 bunker-style refrigeration system might be alleged to infringe the Rubin Carbonaire Plate CO_2 Snow Bunker System. (Pl.'s Ex. HP at 749). In the Rubin Patent [U.S. Letters Pat. No. 3,561,266], carbon dioxide gas was expanded within containers [bunkers] at the top of the vehicle storage area so as to form a deposit of snow within the

containers. (Pl.'s Ex. AL). The snow provided a cold surface on the bottom of the containers to cool the circulating air within the vehicle. In addition, in one embodiment, a single vent was provided in each container to permit carbon dioxide gas to flow into the storage area. In another embodiment, the carbon dioxide gas was vented to the atmosphere outside of the container. There were concerns over a possible patent suit by Burlington Northern. (Def.'s Ex. 39). These concerns ultimately led to a proposed Patent License Agreement between Cryo-Trans and Burlington Northern. (Def.'s Exs. 27, 29, 35, 36; Pl.'s Ex. HP at 745). Cryo-Trans also entered into a Patent License Agreement with the owner of the Rubin Patent. (Tr. 259-264; Def.'s Ex. 48). Given this background, Messrs. Weiner and Hill's desire to obtain a "hold harmless" indemnification from Cryo- Van was understandable.

47. Cryo-Trans' request for "hold harmless" indemnification was accepted by Cryo-Van by letter dated December 12, 1985. In closing, the letter stated the following:

> Regarding a patent, our attorney of Washington, D.C. indicated there is no such patent [that] was applied [for in] recent year[s], however, as you understand, we are going to apply our concept as patent as soon as possible.

In this letter Messrs. Moe and Maxwell never claimed that they were the principal designers of the CRYX 1000. If they had been, it is extremely unlikely that they would have agreed to Mr. Weiner's "hold harmless" request without some reciprocal business consideration.

48. A February 4, 1986 letter written by Cryo-Van to Mr. Weiner upon the completion of the CRYX 1000 also makes no claim that Cryo-Van had designed the CRYX 1000. Instead,

this letter merely refers to the "refurbishment of your CRYX 1000". (Def.'s Ex. 28).

49. Mr. Moe has no credible documentation which clearly and convincingly indicates that he conceived of the invention defined in the '876 Patent prior to the time the invention was conceived by Mr. Hill. The earliest documentation that Mr. Moe has which allegedly supports any claim of inventorship by him is a sketch of a CO_2 container having a manifold and exhaust system, which was sealed and mailed on December 17, 1985--after Mr. Moe had met Messrs. Hill and Weiner. (Pl.'s Ex. AK). The documentation submitted by GATC as evidence that Mr. Moe was the true inventor does not clearly contradict Mr. Hill's claim of inventorship. This Court specifically finds that the testimony of Messrs. Hill and Weiner about the development and invention of the '876 Patent was corroborated by admissible evidence and that Mr. Moe's testimony concerning the same issue was not. Unlike Mr. Hill, Mr. Moe had no historical involvement in the development of cryogenically refrigerated railcars. Mr. Moe had no experience with railcars or with CO_2 manifold systems prior to building the CRYX 1000 for Cryo-Trans.

50. From 1983 to 1988, Mr. David Burgener served as Food Program Manager and/or Director of Applications for the Cardox Corporation. This position gave him engineering and marketing responsibilities with respect to the use of solid or liquid carbon dioxide for the refrigeration of food supplies. As part of the management of Cardox Corporation, Mr. Burgener was aware that a committee of the American Frozen Food Institute was exploring the feasibility of non-mechanical, cryogenic refrigeration for food shipments on railcars, and that Cardox was being solicited as a supplier of the liquid carbon dioxide to be used in such cryogenically refrigerated railcars. Cardox was at that time, and long has been, in the business of

selling solid or liquid carbon dioxide for use in refrigeration systems.

51. In March of 1986, Mr. Burgener witnessed the maiden voyage and unloading of the CRYX 1000 at the Mt. Airy Cold Storage warehouse in Mt. Airy, Maryland. The unloading of the CRYX 1000 occurred on March 14, 1986 at Cryo-Trans' Mt. Airy Cold Storage warehouse in Mt. Airy, Maryland. At the unloading were representatives from Mt. Airy Cold Storage, Lamb-Weston, Liquid Air-Cardox, and the Burlington Northern Railroad. The unloading was also not a secret event. All who attended were there at the invitation of defendant Cryo-Trans' chief executive officer, Mr. Weiner and/or Mr. Hill.

52. A July 2, 1986 letter from Mr. Weiner to Mr. Hill, which significantly predates this controversy and resulting litigation, also documents that Mr. Hill was the inventor of the CRYX 1001 design. (Def.'s Ex. 38).

53. On August 12, 1986, Ralph Hill, while still a Lamb-Weston employee, filed a patent application for the cryogenic refrigeration system at issue. The Hill patent application was prepared by Lamb-Weston's attorney, Kenneth Klarquist. (Stip. No. 8). He did not have a copy of the original design blueprints in his file. He did have a copy of a sketch of the railcar reflecting changes to be made at Mells Cargo from the original CRYX 1000, which he could use to describe the best mode of the patented invention. (Klarquist Dep. at 103; Tr. 546).

54. Kenneth Klarquist, received, but did not disclose to the Patent Office, the Kurth British Patent 399,678 (Stip. No. 10; Pl.'s Ex. CR) ("the Kurth Patent"). Klarquist received the Kurth Patent and other prior art patents from Mr. David Abrams, who was Mr. Weiner's patent attorney. (Stip. No. 9). Klarquist indicated that his usual practice was that he would, in

fact, have received such materials, and supplemented the disclosure already made to the Patent Office if he believed it was appropriate. (Klarquist Dep. at 63, 66-68).

55. The Kurth Patent (Pl.'s Ex. CR) discloses a cryogenic refrigerated railcar with an overhead solid carbon dioxide bunker system having a plurality of openings arranged along the side walls for downward flow into the cargo area of sublimated CO_2 gas. (Pl.'s Ex. CR; Tr. 582, 599).

56. On or about December 2, 1986, the Patent and Trademark Office of the United States Department of Commerce rejected Mr. Hill's patent application stating:

> The following. . . quotation of 35 U.S.C. 103 . . . [is] the basis for all obvious rejections set forth in this Office:
>
> > A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
> >
> > Subject matter developed by another person, which qualifies as prior art only under subsection (f) and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Claims 1-6 are rejected under 35 U.S.C. 103 as being unpatentable over Fink et al or Cryogenic Rail Car in view of Hall. It would [be] obvious to modify either Fink et al or Cryogenic Rail Car to arrange the CO_2 flow within the wall channels for sinuous flow as taught in Hall Fig. 7. (Pl.'s Ex. 2). To obtain reconsideration of this denial, Hill amended Claims 1 and 6 of the Application to stress the corrugated nature of the containers' walls. (Pl.'s Ex. 2).

57. On November 10, 1987, Hill's application was granted, and the '876 Patent was issued. The '876 Patent states that "it is an object of the invention to provide a railcar construction utilizing carbon dioxide snow as the refrigerant wherein all the contents of the car will be maintained within desirable temperature limits during shipment." (Def.'s Ex. 200). The invention relates to a refrigeration system for vehicles, and more particularly to the construction of storage compartments for utilizing carbon dioxide as a refrigerant in transporting products by vehicles such as trucks, trailers, railcars and the like. In April of 1990, Cryo-Trans acquired the '876 Patent from Lamb-Weston. (Def.'s Ex. 142).

58. Mr. Hill testified he last saw the original blueprints at Lamb-Weston. (Tr. 124). During the proceedings in this case, Mr. Hill was unable to produce the original blueprints that led to the '876 Patent. In 1988, after Mr. Hill's departure, Lamb-Weston was sold to Con-Agra, Inc. Thereafter Lamb-Weston's headquarters were moved from Portland, Oregon to Pasco, Washington and a substantial number of business records from Lamb-Weston were discarded. (Stip. No. 27). The original blueprints may have been discarded by Lamb-Weston.

59. Claim 1 of the '876 Patent is an independent claim from which the other claims--claims 2 through 3--depend:

Claim 1. In a container adapted to be maintained in a refrigerated condition from the sublimation of carbon dioxide snow the combination comprising:

> a storage area defined by a floor, a pair of opposed side walls, a pair of opposed end walls, and a ceiling means
>
> an insulated roof positioned above said ceiling means and defining therewith a compartment for supporting a supply of carbon dioxide snow, said compartment extending substantially the full length of said car;
>
> means in said compartment for forming carbon dioxide snow and means for connecting said carbon dioxide snow forming means to a supply of liquid carbon dioxide;
>
> a plurality of openings through said ceiling means adjacent each of said side walls and end walls for permitting the flow of sublimated carbon dioxide gas from said compartment;
>
> each of said walls being corrugated to define a plurality of channels therein open-sided toward the interior of the container whereby said carbon dioxide gas may flow from said openings in said ceiling means downwardly through said channels between said walls and a product load disposed in said container toward said floor.

Claims 2 and 3 of the patent incorporate all of the limitations of claim 1.

In addition to that which is recited in claim 1, claim 2 calls for the "ceiling", or bunker floor, to be insulated to resist heat transfer therethrough:

> *Claim 2.* The container of claim 1 wherein said ceiling means comprises a layer of insulation to inhibit the transfer of heat through said ceiling means from said storage area.

In addition to the limitations of claim 1, claim 3 states that the floor of the container is formed with a plurality of open top channels extending from one end wall to the other:

> *Claim 3.* The container of claim 1 wherein said floor is defined by a plurality load supporting elements defining open top floor channels extending substantially from one end wall to the other.

60. Immediately prior to trial, Cryo-Trans limited its claim for infringement of the '876 Patent to any of Claims 1, 2 and 3. (Final Pretrial Order: Waiver of Claims).

61. The term "adjacent" as used in patents means not necessarily at but nearby or near. (Tr. 539).

62. On November 8, 1977, United States Letters Patent, No. 4,057,367 was issued to Mr. James S. Moe, and Messrs. Marvin B. Carter and Ray L. Carter for their invention of a "*Combined Rotary-Reciprocating Piston Compressor*," *to- wit*: "[a] compact but high volume displacement, relatively noiseless and vibration free compressor for refrigeration gas or the like combining a rotary drive input with six cylinders and three reciprocating pistons within a rotor housed in a stator." (Pl.'s Ex. AY).

63. On August 9, 1988, United States Letters Patent, No. 4,761,969 issued to Mr. James. S. Moe for the invention of "[a] non-mechanical refrigeration system particularly for use in a large insulated container such as a truck or railroad car for maintaining perishables at a desired low temperature during

shipment. A cryogenic material such as liquid CO_2 is used in a plurality of modes to permit or prevent exposure of the foodstuffs to CO_2 vapors." (Pl.'s Ex. AZ).

64. Mr. Moe never sought to patent an invention exactly like the '876 Patent and his attorney never challenged the issuance of the '876 Patent to Mr. Hill.

65. The cryogenic refrigeration system covered by the '876 Patent at issue in this case, is essentially

> [a] railcar refrigerated by carbon dioxide snow [with a] compartment at top for containing a supply of such snow. Openings are provided along each side and end wall for escape of carbon dioxide gas from [the] compartment so it can flow down along each side of load and envelop same. Floor of car is formed with longitudinal channels with manifolds at ends of car to cause flow of gas toward one end along side walls and then through interior channels to discharge opening at opposite end.

66. Columns 1 and 2 of the specification text of the '876 Patent make reference to and distinguish the subject invention from such prior art as the Fink patent, which refers to a bunker-style cryogenically refrigerated railcar, and the AFFX 2001 railcar. As concerns the AFFX 2001 railcar, the '876 Patent notes as a problem the direct deposit of carbon dioxide snow on the cargo load, causing overfreezing at exposed parts of the load. The Fink patent is acknowledged to disclose a bunker to contain carbon dioxide snow out of contact with the load, but is reported to not be effective in enveloping the load with cold carbon dioxide gas since the openings in the bunker floor are only along one side wall of the car. (Pl.'s Ex. A).

67. The specification text and drawings of the '876 Patent describe a railcar refrigerated by carbon dioxide snow which is

deposited in a compartment or bunker beneath the roof of the railcar and overlying the cargo area of the railcar. The use of carbon dioxide as a refrigerant and the use of a bunker to hold carbon dioxide snow is all part of and taught by the prior art.

Openings are provided along each side and end wall of the bunker floor through which sublimating carbon dioxide gas escapes from the bunker to flow down along the side walls and end walls of the car, enveloping the cargo. The use of openings in the ceiling of or in a bunker beneath the roof of a container to allow carbon dioxide gas to escape to and envelop the cargo below is all part of and taught by the prior art.

Each of the cargo area walls is formed with sinuous channels to permit the flow of the carbon dioxide gas towards the floor beneath the cargo. The use of channeled or corrugated walls to permit the flow of the carbon dioxide gas towards the floor beneath the cargo, and the use of sinuous channels for this purpose is all part of and taught by the prior art.

The floor of the car is formed with open top lengthwise channels to receive the carbon dioxide gas and conduct it to one end of the car containing a discharge vent communicating with the atmosphere exterior to the railcar. The use of all-air flooring, including the use of open top lengthwise channels to receive the carbon dioxide gas, was all part of and taught by the prior art.

68. But for the lack of a "compartment" the third clause of claim 1, *to-wit:*

> means in said compartment for forming carbon dioxide snow and means for connecting said carbon dioxide snow forming means to a supply of liquid carbon dioxide Would read on the AFFX 2001 railcar.

69. The '876 Patent specification describes the invention arrangement as effecting a flow of cold carbon dioxide gas from the bunker area to envelop the cargo load in the car.

> "... because the cold carbon dioxide gas is flowing downwardly on each of the opposite sides and on the ends of the car and in direct contact with the bottom of the load, all parts of the load will be maintained at a desirably low temperature to preserve the quality of the product shipment."

70. Because of concerns Mr. Weiner had about C.V. Engineering's ability to quickly construct further CRYX 1000 cars, the CRYX 1000 was sent to Mells Cargo, Inc. ("Mells") in Sacramento, California, an established business with extensive experience in working with railcars. (Tr. 105).

71. Mells rebuilt the CRYX 1000 bunker system and other components of the car. After Mells rebuilt the CRYX 1000, Weiner contracted with Mells to retrofit the first 150 used cars of Cryo-Trans "C" plate fleet. (Tr. 267-68).

72. The original CRYX 1000 included vertical ducts, which served as exhaust vents, which were designed by C.V. Engineering. These ducts were not included in the '876 Patent and were removed at Mells. Mells also rebuilt the flooring in the CRYX 1000. (Tr. 106).

73. Mr. Weiner personally borrowed $8.5 million in order to purchase used mechanical cars and rebuild them into the first 150 cars of Cryo-Trans' "C" plate fleet. (Tr. 267). Thereafter, Mr. Weiner incorporated Cryo-Trans and began entering into leasing agreements with Lamb-Weston and other food processors. While mass construction of the CRYX 1000 was underway, problems developed relating to its manifold pressure which caused the roofs of the railcars to be ruptured.

Cryo-Trans spent close to $1 million working out these problems to improve the CRYX 1000. (Tr. 269-70).

74. During the '876 Patent Application, Lamb-Weston's patent attorney described the Mells' modified version of the CRYX 1000 to the patent examiner. (Tr. 546).

75. Shortly after Cryo-Trans began construction of its "C" plate fleet, Mr. Weiner conceived of an improved "high cube" version of Mr. Hill's design. Instead of being limited by the size of the "C" plate shell, Mr. Weiner's high cube design optimized interior car dimensions to fit the size of the boxes used as product packaging by various food processors.

76. Commencing in the Spring of 1987, Mr. Weiner approached Gunderson, Inc. ("Gunderson") in Portland, Oregon to arrange for the production of a prototype high cube car. Gunderson's engineering department, working in conjunction with Mr. Weiner, developed a comprehensive set of blueprints for the car which Gunderson labeled the "Weinermobile". (Def.'s Ex. 85; Tr. 274).

77. Gunderson built the shell of the high cube car in the Fall of 1987. The car was then moved to Mells where the CO_2 bunker system and walls were installed in accordance with Hill's design, as well as other structures. The car also included a customized "high profile" plug door designed specifically for Cryo-Trans by Youngstown Door Company in Ohio. (Tr. 284).

78. After two years of testing, Cryo-Trans was able to lease fifty high cube production cars in 1989 or early 1990. (Tr. 276-79). By that time, Cryo-Trans had increased its "C" plate fleet to a total of 222 cars which were under lease.

79. The food processors who leased Cryo-Trans' cars were able to ship their product at a transportation cost that was

considerably lower than the cost of using the older, mechanical cars. (Tr. 285-86).

80. Lewis Tyree was an inventor who was active in AFFCAR and who was paid to work on inventions to increase the use of CO_2. It was in his financial interest to come up with an invention similar to the '876 Patent. He did not. (Def.'s Ex. 224 ¶ 33). The same financial incentive applied to David Burgener yet he also did not invent the '876 Patent. (Tr. 988).

81. Burlington Northern had an interest in building a CO_2 railcar that worked. Burlington Northern did not conceive of the '876 Patent design. Instead, it built 75 CO_2 railcars employing the Fink and Habel Patent design, which were not effective.

82. GATC has over 61,000 cars of all types under lease. (Tr. 353). In late 1990, GATC decided it had to promptly get into the cryogenic railcar market and copy Cryo-Trans' high cube car. (Def.'s Ex. 226, Tr. 334-36, 398).

83. GATC recognized it needed the '876 Patent to get involved in the marketplace and tried to hire Mr. Hill. (Tr. 375-77; Def.'s Ex. 223).

84. GATC had Gunderson make a shell identical to the Cryo-Trans high cube car. Gunderson also provided GATC with a set of engineering drawings it had originally made for Weiner and Cryo-Trans. (Def.'s Exs. 127, 131, 133; Tr. 467-69).

85. GATC then moved the shell from Gunderson's to Mells for completion of the interior. The GATC car was completed by Mells along with the identical cars Mells was completing for Cryo-Trans. (Tr. 392).

86. GATC spent $130,000 to have a prototype copy of Cryo-Trans' railcar built as a tag-along order to the Cryo-Trans cars being built. (Tr. 338).

87. The prototype railcar GARX 68000 was originally produced with openings in the bunker floor adjacent the end walls of the car. In April, 1991, after this lawsuit was filed, GATC blocked up these end wall openings before commencing production of the Arcticar railcar design. From its first demonstration run in December 1990 to April 1991, GATC admits the GARX 68000 car literally infringed claims 1, 2, and 3 of the Hill '876 Patent, if valid and enforceable. (Stip. No. 25).

88. The Arcticar is cryogenically refrigerated with carbon dioxide snow deposited in a bunker area beneath the roof of the car. The source of the snow is a manifold pipe mounted along the roof and length of the car, and connected to a source of liquid carbon dioxide for charging the bunker. The floor of the bunker area serves as the ceiling to the cargo area beneath. The walls of the Arcticar in the cargo area are formed with corrugated, open channels extending from the bunker floor to the floor of the car.

89. The bunker floor vent opening arrangement in the Arcticar is as shown in Plaintiff's Exhibit CG. The bunker floor is provided with openings along both side walls (which are disposed 6 inches from the side walls and no closer to any end wall than 3 feet) and a row of openings along the center line of the bunker floor (which are disposed 4 1/2 feet from each side wall and no closer than 6 feet from an end wall). The vent opening arrangement in the Arcticar bunker floor provides a cooling flow which, in the form of sublimated carbon dioxide gas, passes from the bunker area down along both side walls of the railcar and also through the center line openings into a dispersement chamber on top of the load. The gas deposited into the central dispersement chamber on top of the load radiates over the top of the load to permeate through the load and/or spread out over the top of the load to pass down along the side or end

of the load wherever a pressure differential occurs accommodating such a flow.

90. The only significant change made to the GARX 68000 in its transformation into the Arcticar, relative to claims 1, 2 and 3 of the Hill '876 Patent, was the elimination of the ceiling bunker vents on each of the end walls of the railcar. (Stip. No. 26).

91. In designing the Arcticar production railcar, GATC was cognizant of the '876 Patent and eliminated end wall vents on the bunker floor system precisely to avoid infringement of the '876 Patent. (Tr. 521-22).

92. Mr. Mowatt-Larssen, GATC's engineer, admitted that the Arcticar does not work any differently than the first GATC prototype in the way the load is cooled. (Tr. 486).

93. The Court's own observation and inspection of the Arcticar disclosed that it did not work any differently than the Cryo-Trans high cube car.

94. GATC copied the design of the Cryo-Trans high cube car after the commercial viability of the technology was proven by Cryo-Trans.

95. There is no perceptible market difference between the Cryo-Trans railcar and the Arcticar. (Tr. 341, 360-61; Def.'s Ex. 186).

96. Prior to the introduction of the Arcticar production railcar, GATC sought and obtained the advice of outside patent counsel concerning its possible infringement of the '876 Patent. In a written opinion dated November 16, 1990, GATC was advised by outside patent counsel that its Arcticar production railcar design did not infringe the '876 Patent. (Tr. 512-18; Pl.'s Ex. HI).

97. GATC has produced and leased approximately 80 Arcticar railcars. (Stip. No. 16).

98. At the time of trial GATC also had orders for 100 more Arcticar railcars. (Tr. 360).

99. The '876 Patent design has enjoyed a high degree of commercial success, not only from the standpoint of reducing transportation costs for food processors, but also from the standpoint of making Cryo-Trans a profitable leasing company. The '876 Patent design has been accepted by the industry. (Tr. 371; Def.'s Ex. 223). This was the main reason GATC decided to enter the market.

100. The '876 Patent design solved a long felt transportation problem for frozen food processors, who were searching for a viable solution since 1980 to the poor economic and maintenance viability of old railroad mechanical cars. This is especially true in view of our planet's confirmed environmental and related climate problems which have led to new record hot temperatures throughout our country during the last several years.

CONCLUSIONS OF LAW

1. Cryo-Trans has the burden of proving by a preponderance of the evidence that GATC's Arcticar falls within the scope of Claim 1 of the '876 Patent. *Lemelson v. United States*, 752 F.2d 1538, 1547 (Fed.Cir.1985). Literal infringement is found when the accused device embodies all the elements of the claimed invention. *Mannesmann Demag Corp. v. Engineered Metal Prods. Co.*, 793 F.2d 1279, 1282 (Fed.Cir.1986), *Texas Instruments Inc. v. United States Int'l Trade Comm'n*, 988 F.2d 1165, 1171 (Fed.Cir.1993). If the Arcticar is found to have at least each and every feature specified in Claim 1, then the claim is literally infringed. *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 821 (Fed.Cir.1992). Even if all of

the features of the Claim are not literally present, under the "doctrine of equivalents", infringement may be found if the Arcticar performs substantially the same function, in substantially the same way, to achieve substantially the same result as the subject matter of the claim. *Id.* at 821; *Black & Decker, Inc. v. Hoover Serv. Ctr.*, 886 F.2d 1285, 1293-94 (Fed.Cir.1989).

2. The construction of a patent claim is a matter of law which can be determined by a review of all relevant evidence including the patent's prosecution history and extrinsic evidence regarding the true meaning of the language employed in the patent. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 977-79 (Fed.Cir.1995). It is undisputed that GATC's production version of the Arcticar has each and every element of Claim 1 of the '876 Patent except bunker vents "adjacent" to the end walls. (Trial Stip. No. 17). In the Arcticar, the vents nearest each end wall are 2 feet, 9 inches away (Tr. 480). The Arcticar has an interior length of 67 feet, 8 inches, which is identical to the Cryo-Trans car. (Trial Stip. No. 21; Tr. 279-280). Its end-most bunker vents are less than five percent of the distance measured from end to end of the car. Because the terms of a Claim "will be given their ordinary meaning, unless it appears that the inventor used them differently" this Court finds on the basis of all of the relevant evidence that the term "adjacent" as used in the '876 Patent means "not far off". (Ex. 134; Tr. 539). *See ZMI Corp. v. Cardiac Resuscitator Corp.*, 844 F.2d 1576, 1579 (Fed.Cir.1988). Since the vents nearest the end walls of the Arcticar are "not far off", this Court finds the Arcticar within the scope of the meaning of "adjacent" as used in Claim 1.

3. The purpose of the bunker vents of the '876 Patent is to facilitate the passage of sublimating CO_2 along the corrugations making up the walls of the car. The Arcticar's bunker vents are

close enough to provide the same function. Given the proximity of the Arcticar bunker vents to the end walls, the Arcticar literally infringes the '876 Patent.

4. Based on the Court's careful review of all the admissible evidence as well as its personal observation of the two cryogenic railcars, the Court finds that the GATC ARCTICAR is simply a copy of the Cryo-Trans car. The Court's own physical inspection of the Cryo-Trans and Arcticar disclosed that both cars operate in essentially the same manner. The Arcticar performs substantially the same function, in substantially the same way, to achieve substantially the same result as the invention defined in the '876 Patent. (Tr. 540-45, 1084; Def.'s Ex. 234 ¶ 25, Appendices A & B). Thus, Cryo-Trans has carried its burden of proof of establishing that the Arcticar infringes Claim 1 of the '876 Patent under the doctrine of equivalents. *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 70 S.Ct. 854, 94 L.Ed. 1097 (1950).

5. The ARCTICAR has an insulated bunker floor which is the same as the subject matter specified in Claim 2 of the '876 Patent. Claim 2 is therefore literally infringed.

6. The ARCTICAR has a plurality of floor ribs or slats which are the same thing as the subject matter specified in Claim 3 of the '876 Patent. Claim 3 is therefore literally infringed.

7. Cryo-Trans has satisfied its burden of proof in establishing by a preponderance of evidence that the GATC ARCTICAR literally infringes Claims 1, 2 and 3 of the '876 Patent. Alternatively, Cryo-Trans has established that the GATC ARCTICAR infringes the '876 Patent under the doctrine of equivalents.

8. A patent is presumed valid, 35 U.S.C. § 282. The presumption of validity afforded by § 282 places the burden of persuasion by clear and convincing evidence, upon the party

asserting invalidity. *SSIH Equip. S.A. v. United States Int'l Trade Comm'n*, 718 F.2d 365, 375 (Fed.Cir.1983).

9. When all the various terms of a patent claim read directly on an item of prior art, then the prior art "anticipates" the claim and the patent claim is invalid under 35 U.S.C. § 102.

10. When a party asserts that prior use or knowledge of an item by others is prior art, it must be shown that the use was of a complete and operable product that was reduced to practice. *See* 1 Chisum, Patents, § 305 [2], at 3-80; *Medtronic, Inc. v. Daig Corp.*, 611 F.Supp. 1498, 227 U.S.P.Q. 509, 515 (D.Minn.1985), *aff'd*, 789 F.2d 903 (Fed.Cir.), *cert. denied*, 479 U.S. 931, 107 S.Ct. 402, 93 L.Ed.2d 355 (1986). Once the earlier invention has been sufficiently tested to demonstrate that it will work for its intended purpose, the earlier invention is considered reduced to practice. *Atlantic Thermoplastics Co., Inc. v. Faytex Corp.*, 5 F.3d 1477, 1480 (Fed.Cir.1993).

11. In order to be patentable an invention must not be obvious to a person of ordinary skill in the art at the time the invention was made. *Graham v. John Deere Co.*, 383 U.S. 1, 86 S.Ct. 684, 15 L.Ed.2d 545 (1966). Pursuant to 35 U.S.C. § 103, a patent claim is invalid if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject pertains. In determining obviousness, the person of ordinary skill in the art is pictured as working in his shop with the prior art hanging on the walls around him. *Union Carbide Corp. v. American Can Co.*, 724 F.2d 1567, 1576 (Fed.Cir.1984). The obviousness test seeks to determine whether the hypothetical person of ordinary skill in the relevant art, familiar with all that the relevant art discloses and reasonably suggests, would find the claimed invention obvious. *In re Sovish*, 769 F.2d 738, 742 (Fed.Cir.1985).

12. In this case, a person of ordinary skill in the art is an individual having a college degree or equivalent experience in the field of cryogenic refrigeration design and who is mechanically inclined and familiar with refrigerated transport design. These persons are Messrs. David Burgener, Ralph Hill, Erling Mowatt-Larssen, Tom Maxwell, Mel McCracken and James S. Moe.

13. The issue of obviousness under § 103 is a question of law based on the Court's factual determinations. *Graham v. John Deere Co.*, 383 U.S. 1, 86 S.Ct. 684, 15 L.Ed.2d 545 (1966). The Court must usually determine the scope and content of the relevant prior art, the difference between the prior art and the claimed subject matter, the level of ordinary skill in the pertinent field of endeavor and any objective evidence of nonobviousness. *Graham*, 383 U.S. at 18, 86 S.Ct. at 694.

14. Invalidation of a patent claim under § 103 requires a determination that it would have been obvious to combine prior art existing at the time the invention was made to produce the claimed subject matter. 35 U.S.C. § 103; *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1050-51 (Fed.Cir.), *cert. denied*, 488 U.S. 825, 109 S.Ct. 75, 102 L.Ed.2d 51 (1988). Courts are expressly prohibited from using the patent or invention at issue as a guide to combine bits and pieces of earlier designs and then reach a conclusion of obviousness. The decisionmaker must forget what he or she has been taught about the claimed invention and cast the mind back to the time the invention was made. *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1552-1553 (Fed.Cir.1983), *cert. denied*, 469 U.S. 851, 105 S.Ct. 172, 83 L.Ed.2d 107 (1984).

15. The question of obviousness should not be decided by reference through hindsight by using the asserted claim as a guide through a maze of prior art references which combine the right references in the right ways so as to achieve the result of

the invention, as defined by the asserted claim. Monday morning quarterbacking is quite improper when resolving the question of nonobviousness in a court of law. *Orthopedic Equip. Co. v. United States*, 702 F.2d 1005 (Fed.Cir.1983).

16. A showing of commercial success of the patented invention is objective evidence of nonobviousness. *Bio-Rad Lab., Inc. v. Nicolet Instrument Corp.*, 739 F.2d 604, 611-12 (Fed.Cir.), *cert. denied*, 469 U.S. 1038, 105 S.Ct. 516, 83 L.Ed.2d 405 (1984). Another form of objective evidence of nonobviousness is that the patented invention filled a long felt need in the pertinent industry. *Kansas Jack, Inc. v. Kuhn*, 719 F.2d 1144, 1150 (Fed.Cir.1983). Copying or adoption of the patented invention by others is also objective evidence of nonobviousness. *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 679 (Fed.Cir.1988). Finally, recognition and praise of the invention is objective evidence of nonobviousness. *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1555-56 (Fed.Cir.1983), *cert. denied*, 469 U.S. 851, 105 S.Ct. 172, 83 L.Ed.2d 107 (1984).

17. GATC has alleged that the '876 Patent is invalid because its subject matter was known, used, or invented by another. Given the Court's factual findings, GATC has failed to establish, by clear and convincing evidence, that this is the case. The CRYX 1000 does not anticipate the '876 Patent under 35 U.S.C.§102 because the principal design of the CRYX 1000 was conceived of by Mr. Hill. This Court expressly concludes that GATC has failed to establish that the '876 Patent is invalid under any of the other applicable statutes relating to inventorship. *In re Yates*, 663 F.2d 1054 (C.C.P.A.1981): *Novo Industri A/S v. Travenol Lab., Inc.*, 677 F.2d 1202 (7th Cir.1982).

18. GATC has also alleged that the '876 Patent is invalid under 35 U.S.C. § 103 because its claims would have been "obvious". Obviousness is a question of law. *Graham v. John*

Deere Co., 383 U.S. at 15, 86 S.Ct. at 692. Having considered the various factors mandated by *Graham v. John Deere*, and based on the Court's findings of fact this Court expressly finds that GATC has not met its burden of proving invalidity, by clear and convincing evidence, under 35 U.S.C. § 103.

19. The relevant scope and content of prior art in this case includes the Fink and Habel Patent, which is the closest prior art. The Fink and Habel Patent discloses a cryogenic railcar with a bunker with vents only on one side. (Pl's Ex. DF; Tr. 555, 1007, Def.'s Ex. 234 ¶ 22). The Fink and Habel Patent, which relates to the AFFX 2002, was disclosed to the patent examiner by Mr. Hill's attorney. The next most pertinent art, which was also disclosed to the patent examiner, is the Cryogenic Railcar Report which describes the various prototype railcars developed by AFFCAR, including the AFFX 2002. (Def.'s Ex. 18). The Rubin Patent, which involves two containers in a vehicle transport with ceiling vents on both sides is also relevant prior art. (Pl's Ex. AC). This patent was also reviewed by the patent examiner. The Kurth British Patent, which discloses a bunker floor which allows sublimated gas from solid CO_2 to pass through apertures in the bunker floor down into a cargo area is also relevant prior art. (Pl's Ex. CR). The '876 Patent represents a significant improvement from the relevant prior art and is not obvious from a review of the relevant prior art. (Def.'s Ex. 234). No single item of prior art discloses the same thing or anticipates the invention specified by the '876 Patent claims.

20. There is no clear suggestion of combining different pieces of prior art to produce the invention claimed by the '876 Patent unless the patent is improperly used as a guide to make the combination.

21. The '876 Patent discloses a new approach to in-transit cooling. It uses a pre-deep freezing form of cooling because it

substantially pre-deep-freezes the most exposed portion of the load during the time the bunker is being charged with CO_2 snow through an adequate distribution of vents provided from the bunker area.

22. The Court specifically finds that the '876 Patent, as improperly copied by GATC, has had considerable commercial success in the marketplace and has served to satisfy a long felt need in the art. All of these factors, along with the failure of other persons of ordinary skill in the art to make the invention, has served to convince this Court that the '876 Patent is not invalid because its claims would have been "obvious". *Graham v. John Deere Co.*, 383 U.S. 1, 86 S.Ct. 684, 15 L.Ed.2d 545 (1966); *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530 (Fed.Cir.1983); *Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888 (Fed.Cir.), *cert. denied*, 469 U.S. 857, 105 S.Ct. 187, 83 L.Ed.2d 120 (1984).

23. Every applicant for a patent has a duty of candor and good faith in its dealing with the Patent Office and the Examiner handling his application. This means that the applicant and his or her lawyer must not intentionally withhold or misrepresent material information concerning the invention, as defined by the asserted claim. A breach of this duty is inequitable conduct and renders the patent unenforceable.

24. Inequitable conduct before the Patent Office arises from failure to disclose material information, or submission of false material information with an intent to deceive the Patent Office. *FMC Corp. v. Manitowoc Co.*, 835 F.2d 1411 (Fed.Cir.1987). To show that Cryo-Trans is guilty of inequitable conduct because of its "failure to disclose" prior art GATC must offer clear and convincing proof of (1) prior art or information that is material; (2) knowledge chargeable to Hill of that prior art or information and of its materiality; and (3) that Hill's failure to disclose the art or information resulted from an intent to mislead the Patent

Office. *Id.* at 1415; *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 882 F.2d 1556, 1562 (Fed.Cir.1989), *cert. denied*, 493 U.S. 1076, 110 S.Ct. 1125, 107 L.Ed.2d 1031 (1980); *Kingsdown Medical Consultants, Ltd. v. Hollister Inc.*, 863 F.2d 867 (Fed.Cir.1988), *cert. denied*, 490 U.S. 1067, 109 S.Ct. 2068, 104 L.Ed.2d 633 (1989). To satisfy the "intent to deceive" element of inequitable conduct, "the involved conduct, viewed in light of all the evidence, including evidence indicative of good faith, must indicate sufficient culpability to require a finding of intent to deceive." *Paragon Podiatry Lab., Inc. v. KLM Lab., Inc.*, 984 F.2d 1182, 1189 (Fed.Cir.1993).

25. "Inequitable conduct" is not, or should not be, a magic incantation to be asserted against every patentee. Nor is that allegation established upon a mere showing that art or information having some degree of materiality was not disclosed. *FMC Corp. v. Manitowoc Co.*, Inc., 835 F.2d 1411, 1415 (Fed.Cir.1987). A patent applicant is under no obligation to disclose "all pertinent prior art or other pertinent information of which he is aware." *Digital Equip. Corp. v. Diamond*, 653 F.2d 701, 716 (1st Cir.1981). The two controlling factors are the *materiality* of the information and the intent of the action. *Id.*

26. In evaluating "inequitable conduct" the knowledge and actions of a patent applicant's attorneys are chargeable to the applicant. *Argus Chem. Corp. v. Fibre Glass-Evercoat Co.*, 759 F.2d 10, 14-15 (Fed.Cir.), *cert. denied*, 474 U.S. 903, 106 S.Ct. 231, 88 L.Ed.2d 230 (1985).

27. The Kurth Patent qualifies as a prior art publication pursuant to 35 U.S.C. § 102(b). Mr. Hill's failure to disclose the Kurth Patent was material because there was a substantial likelihood that a reasonable examiner would have considered it important in deciding whether to issue the patent-in- suit. *J.P. Stevens & Co. v. Lex Tex, Ltd.*, 747 F.2d 1553 (Fed.Cir.1984), *cert. denied*, 474 U.S. 822, 106 S.Ct. 73, 88 L.Ed.2d 60 (1985).

28. There must be an element of bad faith or total recklessness to find fraud or inequitable conduct. *Digital Equip. Corp. v. Diamond*, 653 F.2d 701 (1st Cir.1981); *Norton v. Curtiss*, 433 F.2d 779, 795-96 (C.C.P.A.1970). *See also* Tegtmeyer, *Fraud on the Patent and Trademark Office Under Rule 56,* 58 J. *Pat. [& Trademark] Off. Soc'y.* 550, 561 (1976).

29. To establish fraud on the Patent Office a substantial degree of "wrongfulness" is required to be shown. Applicants for patents do not engage in fraudulent conduct when they make "honest mistakes in judgment" concerning the information material to consideration of their applications, nor does some slight deviation from the requisite standard of care suffice as fraud. *Digital Equip. Corp. v. Diamond*, 653 F.2d 701, 715 (1st Cir.1981).

30. A fraud finding also requires that the withheld information meet a rather high standard of materiality. "Materiality" has generally been interpreted to mean that if the Patent Office had been aware of the complete or true facts, the challenged claims would not have been allowed. *Norton v. Curtiss*, 433 F.2d 779, 794-95 (C.C.P.A.1970). To establish fraud, the nondisclosed information must be such as to have a likely effect on the scope of allowable claims or the issuance of the patent. It is not enough that the information be simply "relevant" in some general sense to the subject matter of the claimed invention, or even to the invention's patentability. *Digital Equip. Corp. v. Diamond*, 653 F.2d 701, 716 (1st Cir.1981). To satisfy the intent to deceive element of inequitable conduct, "the involved conduct, viewed in light of all the evidence, including evidence indicative of good faith, must indicate sufficient culpability to require a finding of intent to deceive." *Kingsdown Medical Consultants, Ltd. v. Hollister Inc.*, 863 F.2d 867, 876 (Fed.Cir.1988), *cert. denied*, 490 U.S. 1067, 109 S.Ct. 2068, 104 L.Ed.2d 633 (1989).

31. GATC has not shown by clear and convincing evidence that the '876 Patent is unenforceable because of fraud on the Patent Office. There is no evidence indicating intent to mislead the Patent Office in connection with obtaining allowance of the '876 Patent. At best the evidence tends to indicate that Mr. Hill's counsel negligently failed to present certain relevant prior art to the Patent Office. The Court can not conclude that the totality of the circumstances establishes an intent to mislead or deceive the Patent Office by clear and convincing evidence.

32. Mr. Hill's Patent Application, which attached the Cryogenic Railcar Report, sufficiently disclosed relevant prior art. (Def.'s Exs. 1, 2). Although the better practice would have been for Mr. Klarquist to have disclosed the Kurth Patent, this prior art was not intentionally hidden from the Patent Office. Because the materiality of the Kurth Patent is open to some debate because it did not contain a manifold system for manufacturing CO_2 snow, the Court does not find its materiality to be high enough to establish fraud on the Patent Office given the dearth of evidence regarding Mr. Hill's intent to deceive.

33. Mr. Hill was represented by Lamb-Weston's patent attorney during his patent application because at the time he applied for the '876 Patent he was a Lamb-Weston employee. There is no evidence to indicate that Mr. Hill, Mr. Klarquist or Lamb-Weston had any motivation to deceive the Patent Office. To the contrary, the evidence shows that Mr. Hill and Mr. Klarquist both acted in good faith throughout the patent application process.

34. The patent laws provide that Cryo-Trans shall be awarded damages adequate to compensate for any infringement that is proven with "reasonable certainty". Damages are compensation for all loses suffered as a result of the infringement. Adequate compensation should return Cryo-Trans to the position it would have occupied had there been no

infringement. However, Cryo-Trans is not entitled to speculative damages which, although possible, are wholly remote or left to conjecture and/or guess.

35. Lost profits may be in the form of diverted sales, eroded prices, or increased expenses. Cryo-Trans must establish causation between its claimed lost profits and the infringement. A factual basis for the causation is that "but for" the infringement, Cryo-Trans would have made the sales that the infringer made, charged higher prices, and/or incurred lower expenses. In order to show that Cryo-Trans would have made the sales defendant made, plaintiff must show that: (1) there was a demand for the patented product; (2) plaintiff had the ability to meet the market demand; and (3) there were no acceptable non-infringing substitutes or alternatives.

36. "Price erosion" occurs when a plaintiff is forced to lower prices due to the presence in the market of the defendant's infringing product. Cryo-Trans' price erosion losses can include projected future losses which are sufficiently established by a preponderance of the evidence.

37. At the time of trial, Cryo-Trans sought total damages of $51,626,166 which represent treble damages of $17,208,722 in actual damages. Cryo-Trans seeks trebled damages based on the asserted willfulness of GATC's conduct.

38. The parties have agreed that the proper method of assessing damages in this case is the lost profits analysis. (Tr. 1142).

39. The total lost profits to Cryo-Trans for leases entered into by GATC are $8,920,732. (Tr. 656; Supp. 6/15/95 Declaration of Aron Levko). Cryo-Trans has also suffered price erosion for a lease it executed in December of 1994 in the total amount of $562,157 (Tr. 660, 1144; Supp. 6/15/95 Declaration of Aron Levko). The Court specifically rejects some of the

damage calculations made by GATC's expert, Mr. Sims, as being unduly conservative and unreasonable. (Pl.'s Ex. HT).

40. With the elimination of GATC from the market, the Cryo-Trans cars will become the most economical way to transport frozen foods. (Tr. 768-69). Because of this fact, as well as the Court's injunction against GATC's further use of all of its infringing cryogenic railcars, this Court finds that Cryo-Trans' additional price erosion damages of $7,926,250 for further price erosion on its potential future leases is speculative and unsupported by a preponderance of the evidence.

41. Prejudgment interest, at a rate of 7.54%, as the parties have agreed, is appropriate. Therefore, the Court awards prejudgment interest of $222,283. (Supp. 6/15/95 Declaration of Aron Levko).

42. Total damages suffered as a result of the infringement by GATC consisting of lost profits, price erosion and prejudgment interest amount to $9,705,172.

43. After careful consideration of all the relevant facts in this case, including GATC's prior art defense and the opinion letters it received from its counsel prior to its production of the Arcticar, the Court has concluded that GATC's infringement of the '876 Patent was not willful and that this case is not an exceptional case which warrants an award of attorneys' fees in favor of Cryo-Trans. 35 U.S.C. § 284; *Interspiro USA, Inc. v. Figgie Int'l, Inc.*, 18 F.3d 927, 933-34 (Fed.Cir.1994); *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 829 (Fed.Cir.1992); *Avia Group Int'l, Inc. v. L.A. Gear California, Inc.*, 853 F.2d 1557, 1567 (Fed.Cir.1988).

44. In accordance with this opinion, the Clerk of the Court is directed to enter judgment in favor of defendant Cryo-Trans on plaintiff GATC's claim for declaratory judgment pursuant to 28 U.S.C. § 2201 with respect to the enforceability of the '876

Patent. The Clerk of the Court is also directed to enter judgment in the amount of $9,705,172 in favor of defendant Cryo-Trans with respect to its counterclaim for infringement of claims 1, 2 and 3 of the '876 Patent pursuant to 35 U.S.C. § 281. Pursuant to this judgment, GATC is hereby permanently enjoined from any further infringement of the '876 Patent as of August 1, 1995--the date that was used for the calculation of Cryo-Trans' damages.

APPENDIX A

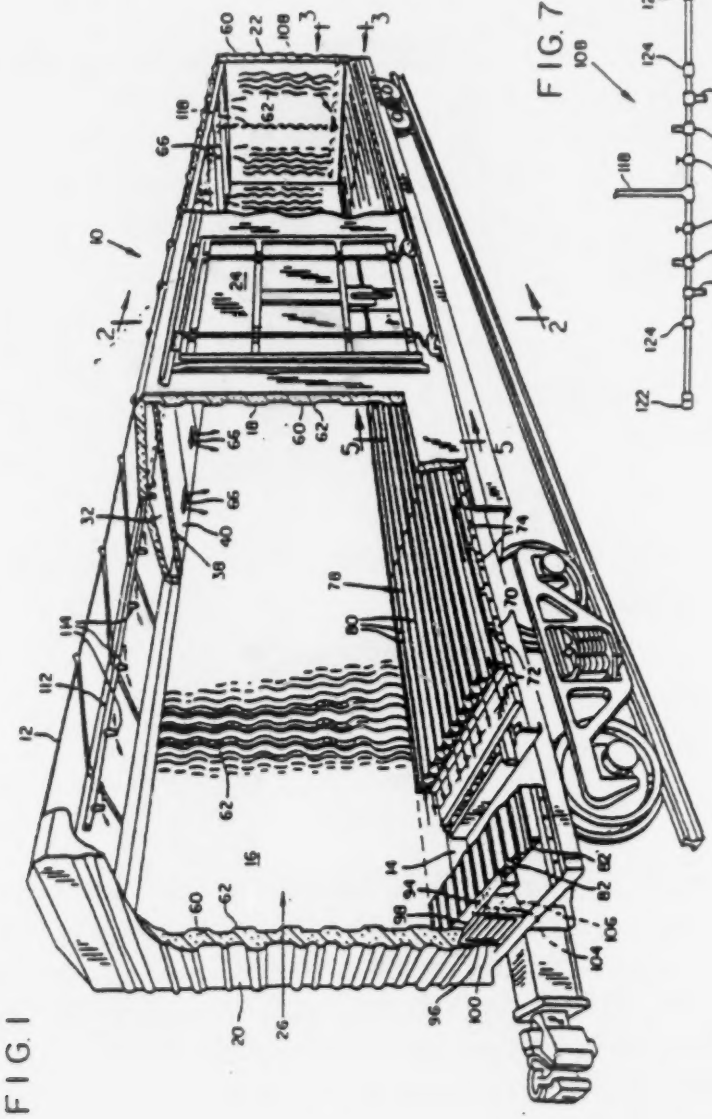


FIG. 1

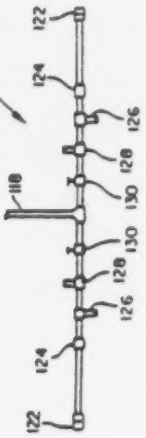


FIG. 7

APPENDIX B

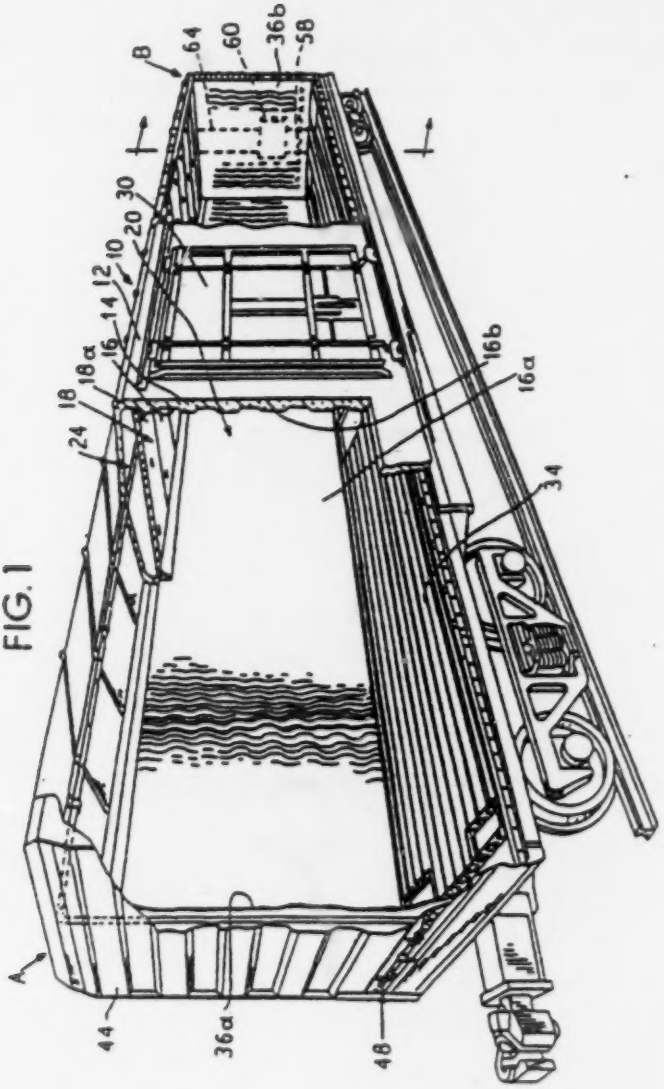


FIG. 1

United States District Court,
N.D. Illinois, Eastern Division

No. 91 C 1305

GENERAL AMERICAN TRANSPORTATION CORPORATION
Plaintiff,

v.

CRYO-TRANS, INCORPORATED,
Defendant.

CRYO-TRANS, INCORPORATED,
Counterclaim-Plaintiff,

v.

GENERAL AMERICAN TRANSPORTATION CORPORATION
Counterclaim-Defendant.

Sept. 1, 1995

Following entry of judgment in action for infringement of a patent for a cryogenic refrigerated rail car, 893 F.Supp. 774, alleged infringer failed motion to amend and supplement court's findings and judgment. The District Court, Castillo, J., held that: (1) lost profit damages award was required to be modified, and (2) injunction permanently enjoining further infringement not only prohibited manufacture, use or sale of specific refrigerated

car which court found to be infringing, but also prohibited "colorable" variation of patent.

Ordered accordingly.

Kenneth J. Jurek, Rosanne J. Faraci, Michele Odorizzi, Damian Gilmary Wasserbauer, Mayer, Brown & Platt, Chicago, IL, Scott William Petersen, Thomas Irving Ross, Randall Thomas Erickson, Hill, Steadman & Simpson, Chicago, IL, for plaintiff.

Kenneth E. Rec.toris, Carol Ann Genis, Bell, Boyd & Lloyd, Chicago, IL, James P. Donohue, Bruce A. Kaser, Miller, Nash, Wiener, Hager & Carlsen, Seattle, WA, David S. Abrams, Mark S. Bicks, Darle M. Short, Roylance, Abrams, Berdo and Goodman, Washington, DC, for defendant.

MEMORANDUM OPINION AND ORDER

CASTILLO, District Judge.

Currently pending before this Court is a motion by plaintiff General American Transportation Corporation ("GATC"), pursuant to Fed.R.Civ.P. 52(b) and 59(e) to amend and supplement the Court's findings and judgment of July 14, 1995. Specifically, GATC's motion seeks to have this Court address three discrete area's of this Court's Memorandum Opinion: (1) to clarify and/or amend the Court's findings with respect to amount of damages awarded to Cryo- Trans, Incorporated ("Cryo-Trans") on the basis of GATC's patent infringement; (2) to amend the language concerning the form and scope of the permanent injunction order entered by the Court; and (3) to make additional findings with respect to relevant prior art and GATC's claim of inequitable conduct. GATC's motion is granted, in part, and denied, in part, as fully set forth in this opinion. The Court will address each of the three subjects of the

pending motion in the order addressed by GATC. Lastly, this opinion will also address the Bill of Costs sought by Cryo-Trans.

The Damages Awarded to Cryo-Trans

This Court awarded Cryo-Trans total lost profit damages of $8,920,732 (7/14/95 Mem.Op.¶39). GATC complains that this award should be reduced because this Court also enjoined GATC from any further patent infringement. GATC asserts that Cryo-Trans has admitted that its lost profit damages, in the event of an injunction, would be limited to $2,069,157 plus price erosion damages of $562,157 as found by the Court, prejudgment interest and any additional lost profits for the one-month extension of the effective date of the injunction to September 1, 1995.

At trial, Cryo-Trans principally relied on the testimony and declarations of Aron Levko, a principal in the firm of Coopers & Lybrand, to establish damages. In Mr. Levko's post-trial declaration to the Court he included three separate damage scenarios: (1) Scenario # 1 assumed that the Court would not enjoin GATC and calculated damages as totaling $17,631,422; (2) Scenario # 2 assumed that the Court would enjoin GATC and calculated damages as totaling $15,250,813; (3) Scenario # 3 assumed that the Court would not enjoin GATC from continuing to lease the 80 cryogenic railcars now in service but would prohibit GATC from placing 30 additional cars into service and calculated damages as totaling $17,208,772.

GATC relied on the testimony of its expert witness, Raymond Sims, at trial. Mr. Sims analyzed Cryo-Trans' potential damages by making three assumptions-- all of which have proven to be true. Mr. Sims assumed that the disputed patent was valid, that GATC would be found to have infringed the patent and that an injunction would be entered at the conclusion of the trial. (Tr. 1127). Mr. Sims admitted that

Cryo-Trans should be made whole and placed in the position that it would have been but for the infringement. (Tr. 1128). These damages would have included lost profits and some element of price erosion and were conservatively estimated by Mr. Sims to total $1.9 million. (Tr. 1128-1129).

The Court in its July 14, 1995 Memorandum Opinion rejected portions of all of the parties' alternative damage scenarios.[1] Instead, the Court awarded lost profits of $8,920,732 and rejected Cryo-Trans' additional price erosion damages as speculative. This Court specifically stated that based, in part, on the Court's injunction against GATC's further use of all of its infringing cryogenic railcars, it found that Cryo-Trans' additional price erosion damages of $7,926,259 for further price erosion on its potential future leases was speculative and unsupported by the preponderance of the evidence. (7/14/95 Mem.Op.¶40).[2]

GATC's post-trial motion correctly notes that this Court relied on Mr. Levko's Scenario # 1 calculations in deciding the appropriate damages in this case. The Court's current total damage award of $9,705,172 is the sum of lines I(A), I(B), II(A)(1) and III(A) of Scenario 1. The Court's use of these

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[1] This Court's July 14, 1995 opinion, just like the parties' pre and post-trial briefs, devoted the vast majority of its opinion to issues of patent validity and infringement rather than the appropriate damages. Additionally, this Court felt somewhat constrained about setting forth its full damages analysis in its published opinion because this material has been deemed confidential by the parties in this case. However, because it is clear that the issue of damages is one of several issues that will be reviewed by the federal circuit court of appeals, this Court has decided to elaborate on its damages analysis herein.

[2] Despite GATC's arguments to the contrary, this finding did not mean that the Court had rejected all of Cryo-Trans' additional requested price erosion damages. This finding merely indicated that the $7,926,259 figure was not appropriate under the circumstances.

figures was its best estimate of the damages that would adequately compensate Cryo-Trans for GATC's infringement. *Rite-Hite Corp. et al. v. Kelley Company, Inc.*, 56 F.3d 1538, 1544 (Fed.Cir.1995); *SmithKline Diagnostics v. Helena Laboratories*, 926 F.2d 1161, 1164 (Fed.Cir.1991). However, because the Court recognizes that Mr. Levko's Scenario # 1 calculations were based on the express premise that an injunction would not issue and because this Court still believes that the issuance of an injunction is a proper remedy in this case, this Court has decided to revise its award of damages to eliminate the internal inconsistency in using Mr. Levko's Scenario # 1 calculations. Therefore, this Court has decided to modify paragraphs 39 through 42 of its July 14, 1995 Memorandum Opinion. These paragraphs of the opinion will be replaced by the following paragraphs:

> 39. This Court expressly credits the testimony of Cryo-Trans' damage expert Aron Levko as setting forth reasonable assumptions about the extent of infringement damages suffered by Cryo-Trans. In particular, this Court finds that the lost profits on GATC leases of F Plate cars which infringe the '876 Patent are $2,144,363. This Court further finds that Cryo-Trans has suffered price erosion damages as a result of GATC's infringement. Specifically, this Court finds that price erosion damages are appropriately awarded to Cryo-Trans because it will not be able to instantly lease replacement cars to the relevant companies on September 1, 1995 and there is a reasonable likelihood that the price it previously secured for its cars will be negatively impaired by GATC's prior infringement. (Tr. 293, 683, 685, 1144). Therefore, the Court finds Cryo-Trans has suffered price erosion damages of $3,024,052 on the current GATC leases of infringing F Plate cars; price

erosion damages of $1,476,855 on the leased but not yet placed infringing GATC F Plate cars; price erosion damages of $567,954 on its current leases of F Plate cars; price erosion damages of $502,738 on its further lease renewal of F Plate cars; and price erosion damages of $1,030,273 on its future renewal of leases of its C Plate cars. (8/7/95 Supp.Declaration of A. Levko, Scenario # 2; Schedules B- 1, B-2, C-1, C-3 and C-4). The total damages suffered by Cryo-Trans are hereby determined by this Court to be $8,746,235. The Court specifically rejects some of the damage calculations made by GATC's expert, Mr. Sims, as being unduly conservative and unreasonable (Pl.'s Ex. HT).

40. With the elimination of GATC from the market on September 1, 1995, the Cryo-Trans car will become the most economical way to transport frozen foods. (Tr. 768-69). Because of this fact, as well as the Court's injunction against GATC's further use of all of its infringing cryogenic railcars, this Court finds that Cryo-Trans' additional price erosion damages of $6,486,093 for price erosion on Cryo-Trans' leases on F Plate cars based on anticipated growth occurring between 1996 and 2004 is speculative and unsupported by a preponderance of the evidence. (8/7/95 Supp.Declaration of A. Levko, Scenario # 2; Schedule D-3).

41. Prejudgment interest, at a rate of 7.54%, as the parties have agreed, is appropriate. Therefore, the Court awards prejudgment interest of $237,205. (8/7/95 Supp.Declaration of A. Levko, Scenario # 2; Schedule F).

> 42. Total damages suffered as a result of the infringement by GATC consisting of lost profits, price erosion and prejudgment interest amount to $8,983,440.

Scope Of The Court's Injunction

The injunction entered by this Court on July 14, 1995 merely stated that GATC was "permanently enjoined from any further infringement of the '876 Patent". (7/14/95 Mem.Op.¶44). GATC asserts that this injunction is too broadly worded and thereby offends Fed.R.Civ.P. 65(d). *See KSM Fastening Systems, Inc. v. H.A. Jones Co., Inc.*, 776 F.2d 1522, 1526 (Fed.Cir.1985). GATC asserts that this Court's injunction should only prohibit the manufacture, use or sale of the specific GATC Arcticar which this Court found to be infringing. GATC intimates that, despite this Court's July 14, 1995 Memorandum Opinion, it may seek to undertake a further "colorable variation" of the '876 Patent. The Court expressly warns GATC that any further infringing activity may place GATC at risk of contempt. *See KSM Fastening Systems, Inc.*, 776 F.2d at 1527. Nevertheless, in recognition of some valid concerns raised by GATC this Court hereby modifies Paragraph 44 of its July 14, 1995 Memorandum Opinion as follows:

> 44. In accordance with this opinion, the Clerk of the Court is directed to enter judgment in favor of defendant Cryo-Trans on plaintiff GATC's claim for declaratory judgment pursuant to 28 U.S.C. § 2201 with respect to the enforceability of the '876 Patent. The Clerk of the Court is also directed to enter judgment in the amount of $8,983,440 in favor of defendant Cryo-Trans with respect to its counterclaim for infringement of Claims 1, 2 and 3 of the '876 Patent pursuant to 35 U.S.C. § 281. Pursuant to this judgment, effective as of September 1, 1995 and until

such time as U.S. Patent No. 4,704,876 expires, General American Transportation Corporation is permanently enjoined from making, using, leasing or selling, without authorization, right or license, cryogenic refrigerated railcars of a structure adjudicated in this case to infringe Claims 1, 2 and 3 of United States Patent No. 4,704,876.

GATC's Request For Additional Findings of Fact

Fed.R.Civ.P. 52(b) "provides for post-judgment motions for findings not made". GATC expressly notes that the Federal Circuit has encouraged appellants to request additional findings under this rule to head off a possible remand by the Court for incomplete findings. *See Consolidated Aluminum Corp. v. Foseco Int'l Ltd.*, 910 F.2d 804, 814 n. 9 (Fed.Cir.1990). After careful consideration of GATC's request under Fed.R.Civ.P. 52(b) this Court hereby modifies Paragraph 30 of the Findings of Fact of its July 14, 1995 Memorandum Opinion as follows:

30. There is a dispute as to how the sublimated CO_2 gas would flow in the AFFX 2002. Many of the people involved in developing the AFFX 2002, including Messrs. Hill, Couture, Habel and Barron, believed that its CO_2 gas would drop down the sidewall nearest the bunker toward the aluminum floor racks, pass through the gaps between the slats on the aluminum floor racks beneath the load, and then go up on the opposite sidewall of the car and over the top of the load. (Tr. 87-88; Def.'s Ex. 233¶14; Tr. 445; Habel Dep. at 148; Barron Dep. at 18). Mr. Fink, who also was involved in the design of the AFFX 2002, however, believed that the gas would flow on top of the load and go down both sidewalls. (Tr. 849). This theory of gas flow is contrary to what is claimed as the gas flow in the Fink and Habel Patent. (Pl.'s

Ex. DF; Tr. 858). While GATC's in-court demonstration was of interest in trying to determine through the use of a simulated model how the AFFX 2002 actually may have worked, (Pl.'s Ex. HK), it is not entitled to much weight because it does not answer the question of how the relevant persons in the art believed the AFFX 2002 worked during the relevant time period. *The Court, therefore, finds that GATC failed to demonstrate by clear and convincing evidence that Ralph Hill or the others involved with AFFCAR understood that the AFFX 2002 worked differently than as disclosed in the Fink and Habel Patent.*

This Court has expressly concluded that no other additional findings of fact need be made to its July 14, 1995 Memorandum Opinion.[3] The Court also specifically finds that the trial testimony concerning David Burgener did not in any way materially affect its judgment in this case. While there is some trial testimony that a reverse-flow channel arrangement was given to Ralph Hill by David Burgener prior to Mr. Hill's patent application (Tr. 1030; 1033-35; Pl.'s Ex. FH) there is no evidence establishing that this drawing was intentionally or

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[3] The new legal and factual determinations made herein do not in any way change this Court's analysis that a patent infringement occurred in this case. In fact, the recent case of *Hilton Davis Chemical Co. v. Warner-Jenkinson Co., Inc.*, 62 F.3d 1512 (Fed.Cir.1995) further supports this Court's conclusion that a patent infringement under the doctrine of equivalents occurred in this case. The *Hilton Davis* Court noted that mere colorable differences, such as are present in this case, cannot displace the patent rights of an original inventor. 62 F.3d at 1516-17 quoting Chief Justice Story in *Odiorne v. Winkley*, 18 F.Cas. 581, 582 (C.C.D.Mass.1814) (No. 10,432). Furthermore, the *Hilton Davis* Court reiterated that evidence of copying, such as occurred in this case, is extremely relevant to an analysis of infringement under the doctrine of equivalence without any requirement of proving bad faith.

unintentionally withheld from the Patent Office. Moreover, given this Court's overall factual findings concerning prior art and inequitable conduct, the overall relevance of the reverse-flow channel arrangement is marginal at best. Mr. Burgener did not claim that a reverse- flow floor channel was his invention. (Tr. 1083). Simply put, GATC failed to demonstrate by clear and convincing evidence that Mr. Burgener's drawing was material to any claim concerning the '876 Patent.

Bill Of Costs

Under Fed.R.Civ.P. 54(d) the presumption is that the prevailing party will recover costs, and the ultimate decision to award costs is within the court's discretion. *Finchum v. Ford Motor Co.*, 57 F.3d 526, 533 (7th Cir.1995). Cryo-Trans seeks total costs of $25,916.70. This Court, based on its experience, finds that the costs sought by Cryo-Trans in view of the complexity and length of this litigation are eminently reasonable. The Court, however, will sustain GATC's objections to the $1,210.00 in costs relating to the physical inspection of the Cryogenic railcars. Thus, the Court hereby awards total costs of $24,706.00 to Cryo-Trans.

United States Court of Appeals for the Federal Circuit

Filed Oct 10 1996

ORDER

A combined petition for rehearing and suggestion for rehearing in banc having been filed by the APPELLEE, and a response thereto having been invited by the court and filed by the APPELLANT, and the petition for rehearing having been referred to the panel that heard the appeal, and thereafter the suggestion for rehearing in banc and response having been referred to the circuit judges who are in regular active service,

UPON CONSIDERATION THEREOF, it is

ORDERED that the petition for rehearing be, and the same hereby is, DENIED and it is further

ORDERED that the suggestion for rehearing in banc be, and the same hereby is, DECLINED.

The mandate of the court will issue on October 17, 1996.

FOR THE COURT,

Dated: October 10, 1996

/s/ Brian P. LeDuc
Brian P. LeDuc
Associate Chief Deputy Clerk

cc: KENNETH J. JUREK
JAMES P. DONOHUE

GENERAL AMER v. CRYO-TRANS, 95-1531
(DCT–91-CV-1305)

FILED
FEB 26 1997
CLERK

No. 96-1093

In The

Supreme Court of the United States

October Term, 1996

CRYO-TRANS, INC.,

Petitioner,

vs.

GENERAL AMERICAN TRANSPORTATION CORPORATION,

Respondent.

On Petition For Writ Of Certiorari To The United States Court Of Appeals For The Federal Circuit

BRIEF IN OPPOSITION TO PETITION FOR WRIT OF CERTIORARI

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STATEMENT UNDER RULE 14.1(b) AND 29.6

The names of all parties to this proceeding in the court whose judgment is sought to be reviewed appear in the caption of this brief in opposition.

The parent company of respondent General American Transportation Corporation is GATX Corporation.

Respondent General American Transportation Corporation does not have any nonwholly-owned subsidiaries.

TABLE OF CONTENTS

Page

STATEMENT UNDER RULE 14.1(b) AND 29.6 i

TABLE OF AUTHORITIES iii

SUMMARY OF ARGUMENT 1

COUNTER STATEMENT OF THE CASE 2

REASONS TO DENY THE PETITION 9

I. The Issue Presented By The Petition Was Decided By This Court In *Markman* 9

II. The Federal Circuit's Decision Here Is Fully In Accord With *Markman* And Other Decisions Of This Court 13

CONCLUSION 16

TABLE OF AUTHORITIES

Page

CASES:

Amhil Enters. v. Wawa, Inc., 81 F.3d 1554 (Fed. Cir. 1996) 13

Elder v. Holloway, 510 U.S. 510 (1994) 11

Engel Indus. v. Lockformer Co., 96 F.3d 1398 (Fed. Cir. 1996) 13

First Options v. Kaplan, 514 U.S. ___, 115 S.Ct. 1920 (1995) 11

Gasperini v. Center for Humanities, 518 U.S. ___, 116 S.Ct. 2211 (1996) 14

Hilton Davis Chem. Co. v. Warner-Jenkinson Co., 62 F.3d 1512 (Fed. Cir. 1995) (in banc), *cert. granted*, ___ U.S. ___, 116 S.Ct. 1014 (1996) 12

Hogg v. Emerson, 47 U.S. (6 How.) 437 (1848) 12

Markman v. Westview Instruments, 517 U.S. ___, 116 S.Ct. 1384 (1996) ..... *passim*

Markman v. Westview Instruments, 52 F.3d 967 (Fed. Cir. 1995) (in banc), *aff'd*, 517 U.S. ___, 116 S.Ct. 1384 (1996) ..... *passim*

Merrill v. Yeomans, 94 U.S. 568 (1877) 12

Pierce v. Underwood, 487 U.S. 552 (1988) 11

Perkin-Elmer Corp. v. Westinghouse Elec. Corp., 822 F.2d 1528 (Fed. Cir. 1987), *cert. denied*, 485 U.S. 961 (1988) 8

Salve Regina College v. Russell, 499 U.S. 225 (1991) ... 13, 14

Slimfold Mfg. Co. v. Kinkead Industries, Inc., 932 F.2d 1453 (Fed. Cir. 1991) 12

TABLE OF AUTHORITIES – Continued

Page

Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576 (Fed. Cir. 1996) 13

Winans v. Denmead, 56 U.S. (15 How.) 330 (1854) 15

RULES:

Fed. R. Civ. P. 52(a) 1, 9, 10

BRIEF IN OPPOSITION TO PETITION FOR WRIT OF CERTIORARI

Respondent General American Transportation Corporation ("GATC") submits this brief in opposition to Cryo-Trans' Petition for a Writ of Certiorari. Respondent respectfully submits that this Court should deny the Petition to review the judgment of the Court of Appeals for the Federal Circuit in this case.

SUMMARY OF ARGUMENT

The question of the appropriate standard for reviewing a district court's interpretation of a claim of a patent (that is presented by the Petition) necessarily was decided by this Court in *Markman v. Westview Instruments*, 517 U.S.___, 116 S.Ct. 1384, 1387 (1996), wherein this Court unambiguously held that "the construction of a patent, including terms of art within its claims, is exclusively within the province of the court." Petitioner now requests this Court to find that claim construction is an issue of fact subject to Rule 52 of the Federal Rules of Civil Procedure, when this Court clearly has held that it is not. This Court plainly recognized in *Markman* the benefits to the judicial process of treating "interpretive issues," such as construction of patent claims, "as purely legal." *Markman*, 517 U.S. at ___, 116 S.Ct. at 1396. Having decided that claim construction will be treated as an issue of law for a court – not an issue of fact for a jury – and having affirmed the Court of Appeals for the Federal Circuit, this Court signaled the application of general appellate rules with respect to the standard of review

applicable to questions of law. Under well established appellate jurisprudence, questions of law, including questions of patent claim construction, are subject to a *de novo* standard of review.

Thus, the fundamental premise of the Petition by Cryo-Trans is flawed: the issue presented is not an important unresolved issue. Indeed, the *in banc* decision by the Federal Circuit in *Markman*, which this Court affirmed, expressly held that "[b]ecause claim construction is a matter of law, the construction given the claims is reviewed *de novo* on appeal." *Markman v. Westview Instruments*, 52 F.3d 967, 979 (Fed.Cir. 1995) (in banc), *aff'd*, 517 U.S.___, 116 S.Ct. 1384 (1996). The Petition does not suggest any conflict between any decisional law. The Petition does not provide any compelling reasons for the exercise of this Court's discretion. The Petition does not present any reason why this Court now should revisit its recent, unanimous decision in *Markman*.

COUNTER STATEMENT OF THE CASE

The issues before the Court of Appeals for the Federal Circuit in this case presented only a straightforward application of well established principles of law; the appeal to the Federal Circuit did not raise any precedent-setting issues or any conflicts in decisional law which required resolution. The appeal did not question the standard of review applicable to the issue of claim construction, or even suggest that the Federal Circuit's methodology for resolving issues of claim construction required either a major overhaul or even a modest tune

up. Indeed, Petitioner's appeals Brief readily conceded that claim construction is a matter of law. Consistent with *Markman v. Westview Instruments*, 52 F.3d 967, 979 (Fed. Cir. 1995) *(in banc), aff'd*, 517, U.S. ___, 116 S.Ct. 1384 (1996), the Federal Circuit here treated the issue of the proper interpretation of disputed language in a patent claim as a question of law, subject to a *de novo* standard of review. This is the very same approach that has been followed consistently by the Federal Circuit since its landmark decision in *Markman* was affirmed by this Court

During the course of this case, the parties essentially were in agreement that GATC did not infringe the patent-in-suit if the claims were interpreted in the manner urged by GATC, which was the construction given to the claims by the Magistrate Judge (after a multi-day preliminary injunction hearing) and initially adopted by the district court. The parties also agreed that GATC did indeed infringe the patent if the claims were construed in the way advocated by Cryo-Trans and accepted by the district court after trial. The validity/invalidity assertions depended on which construction of the claims was adopted. GATC essentially acknowledged validity if the patent was construed as GATC urged, but challenged validity if the patent claims were construed in the way advanced by Petitioner. Having agreed with GATC that the district court's claim construction was not correct as a matter of law, because the disputed claim language should be given the ordinary meaning manifest from the patent and file history, the Federal Circuit deemed

GATC's validity challenge no longer pertinent, and therefore declined to otherwise speculate on invalidity of the properly construed claims. (App. 12a.)

The patent-in-suit (the '876 Patent) concerns a cryogenic railcar for transporting frozen food. Cryogenic railcars use carbon dioxide (CO_2) as the refrigerant, whereas conventional refrigerated cars employ more expensive mechanical refrigeration systems. (App. 2a.)

The invention of the patent was an improvement in a crowded art. The cryogenic railcar claimed in the '876 patent was one of many cryogenic systems for containers that received a patent. (App. 30a, 31a, 36a, 39a, 40a, 43a.) In the claimed invention of the '876 patent, the railcar has an insulated compartment that extends lengthwise at the upper portion of the interior of the car forming a bunker which overlies the load. The bunker is charged with CO_2 gas. The bunker floor has a plurality of openings "adjacent each" of the corrugated side walls and corrugated end walls to permit sublimated carbon dioxide gas to flow down each of the walls and surround or envelope the load.

Every element of each patent claim except the element requiring separate openings along each of the four walls, was in the prior art, as the district court found (and those findings were unassailed on appeal).

- "The [prior art] Kurth patent discloses a cryogenic refrigerated railcar with an overhead solid carbon dioxide bunker system having a plurality of openings arranged along the side walls for downward flow into the cargo area of sublimated CO_2 gas." (App. 40a.)

- "The use of carbon dioxide as a refrigerant and the use of a bunker to hold carbon dioxide snow is all part of and taught by the prior art." (App. 45a.)
- "The use of openings in the ceiling of or in a bunker beneath the roof of a container to allow carbon dioxide gas to escape to and envelop the cargo is all part of and taught by the prior art."*(Id.)*
- "The use of channeled or corrugated walls to permit the flow of the carbon dioxide gas towards the floor beneath the cargo, and the use of sinuous channels for this purpose is all part of and taught by the prior art." *(Id.)*
- "The use of all-air flooring, including the use of open top lengthwise channels to review the carbon dioxide gas, was all part of and taught by the prior art." *(Id.)*

Even the Burlington Northern cryogenic railcar design (which Petitioner now calls a failure) was virtually identical to the car claimed in the patent, with one major exception: the openings in the bunker in the Burlington Northern cars were along only one side wall. (App. 9a, 29a, 44a.) This design caused hot spots along the wall furthest away from the openings. (App. 9a, 31a.)

GATC entered the business by designing a railcar to avoid infringement of the properly construed claims of the patent. (App. 50a.) GATC's Arcticar eliminated the openings adjacent or along the end walls of the car, thus leaving a structure with openings adjacent only to the side walls. (App. 22a, 50a.) Moreover, GATC's car, unlike the car claimed in the patent, uses a dispersement chamber effect, as found by the district court (App. 49a-50a),

and thus the Arcticar functioned differently than the car claimed in the '876 patent. Indeed, in November of 1991, GATC obtained U.S. Patent No. 5,168,717 which covered the design of its Arcticar. (App. 22a.)

Although the Arcticar did not have openings adjacent to the end walls, as the district court noted (App. 22a), the district court nonetheless found infringement because under its claim construction any opening that is not far off a wall is "adjacent" to that wall. Of course, in a relatively small structure like a 9' x 68' railcar, everything is "not far off" all walls. Thus, according to the district court's analysis, an opening 3 inches from a side wall and 2 feet 9 inches from an end wall could perform double duty as being adjacent to both walls, despite claim language, drawings, and disclosures in the specification which required a plurality of separate openings dedicated to each wall which were adjacent to one wall by their close proximity to that one wall. Indeed, under the district court's construction, one opening could be adjacent to at least three, and maybe even four walls, depending on its placement.

Although the district court cited *Markman*, it did not examine the full language of the claims, the disclosures in the specification, or the arguments in the file history in reaching its construction of the claims. Rather, it focused only on the word "adjacent." The district court relied on a dictionary definition of the word "adjacent" and noted that a patent lawyer (Mr. Gerstman) had expressed the view at trial that "adjacent" as used in patents generally means "not necessarily at, but nearby or near." (See App. 43a, 52a.)

At trial, GATC did not seek to introduce patent lawyer expert testimony to refute Mr. Gerstman's testimony regarding the general meaning of "adjacent" in patents. Rather, at trial, and then on appeal, GATC argued that it was error to decide the meaning of disputed language by resorting to extrinsic evidence, such as patent lawyer testimony or a dictionary definition of a single isolated word in a disputed limitation of a claim. The language of the claim as a whole, as supported by the specification and file history, argued GATC, made the scope of the claims absolutely clear. Indeed, a definition of "not far off" is only one of many dictionary definitions of "adjacent" and some of the other definitions actually compelled a different definition which supported GATC's view of the claims. And, Mr. Gerstman's testimony of general meanings in other patents of the word "adjacent" could not change the clear meaning of the disputed limitation here when that meaning is absolutely clear from the patent itself.

Thus, GATC merely urged the Federal Circuit to follow *Markman* and consider the clear language of the patent. There were no credibility determinations made by the trial judge, no factual inferences drawn by the trial judge, and no fact findings relating to claims construction with which the appeals court had to contend. The district court merely relied on extrinsic evidence to the exclusion of intrinsic evidence in reaching a legal conclusion.

The Federal Circuit's decision in this case reflects nothing more than a traditional application of *Markman* and other well established rules of claim construction. The Federal Circuit carefully reviewed the distict court's findings and conclusions. It observed that the asserted

claims clearly require "that the openings adjacent to the side walls are structurally distinct from the openings adjacent to the end walls." (App. 7a.) The Federal Circuit found that the "district court's claim construction obliterated that distinction." (*Id.*)

The Federal Circuit then reviewed the specification and file history and concluded that the meaning of the disputed limitation, which was manifest from the claims, was clearly supported by the specification (the file history was not particularly helpful). (App. 8a.) The Federal Circuit rejected the district court's claim construction because it was "inconsistent with the specification and drawings and rendered superfluous the claim requirement for openings adjacent to the end walls." (*Id.*) The Federal Circuit's decision thus not only was consistent with *Markman*, but also with the unassailable precedent which holds that claims construction may not erase important limitations in the claim. *E.g., Perkin-Elmer Corp. v. Westinghouse Elec. Corp.*, 822 F.2d 1528, 1532 (Fed. Cir. 1987), *cert. denied*, 485 U.S. 961 (1988).

This was not a case where the Federal Circuit merely ignored the trial judge's claim construction. The Federal Circuit decided that the district court's claim construction was legally erroneous because it destroyed limitations in the claim and was inconsistent with the patent. Indeed, the district court did not once mention the language of the patent in arriving at its construction; whereas the Federal Circuit, as it was required to do, examined the patent in detail, and quoted extensively from it in reaching a conclusion. Since the meaning of the disputed language was absolutely clear from the patent, there was no need to resort to extrinsic evidence, especially since that

limited extrinsic evidence led to an interpretation which was inconsistent with the patent and also created substantial issues of invalidity. The Federal Circuit reversed the district court because GATC did not infringe the properly construed claims.

REASONS TO DENY THE PETITION

I. The Issue Presented By The Petition Was Decided By This Court In *Markman*.

Petitioner essentially asks this Court to revisit the Court's decision in *Markman v. Westview Instruments*, 517 U.S. ___, 116 S.Ct. 1384 (1996), now, less than one year after it was decided. Petitioner asks this Court to raise extrinsic evidence to a new and dispositive level. According to Petitioner, whenever a trial judge credits extrinsic evidence, notwithstanding clear legal error in failing to consider properly the patent or its file history, the Federal Circuit must defer to the trial court's claim construction because it has become a factual determination subject to Rule 52(a) of the Federal Rules of Civil Procedure. Petitioner is wrong. Indeed, the very issue it now urges as an important unresolved issue was necessarily decided by this Court in *Markman*. A district court's construction of the claim of a patent is a question of law and as such it is subject to review *de novo*.

In its *in banc* decision in *Markman*, the Federal Circuit grappled with the issue of whether claim construction belonged to the jury as a matter of fact or was within the province of the court as an issue of law. This was an

important distinction for purposes of appeal "[s]ince matters of law must be reviewed *de novo* and matters of fact must be accorded substantial deference . . . " *Markman*, 52 F.3d at 976. Reviewing precedent, fundamental principles of American law and the interests of the patent system, the Federal Circuit plainly decided that claim construction was a question of law subject to *de novo* review. *Id.* at 976-979. This Court affirmed, and by doing so, answered the question now presented by the Petition: a district court's claim construction is accorded *de novo* review because it is to be treated as a question of law.

This Court's decision in *Markman* squarely addressed the issue "whether the interpretation of a so-called patent claim . . . is a matter of law reserved entirely for the court . . . " *Markman*, 517 U.S. at ___, 116 S.Ct. at 1387. It held that it was. *Id.* Having determined that the interpretation of a claim of a patent is exclusively in the province of a court as a question of law, this Court necessarily concluded, as did the Federal Circuit, that the issue was subject to *de novo* review. Petitioner's claim that the issue of claim construction presents a mixed issue of law and fact, which should be treated as an issue of fact subject to the clearly erroneous standard of Fed. R. Civ. P. 52(a), ignores the holding by the *Markman* Court that all issues of claim construction will be treated as a question of law for a court irrespective of any factual underpinnings in the decisional process. *Markman*, 517 U.S. at ___, 116 S.Ct. at 1395-96. Indeed, when this Court decided in *Markman* that the issue of claim construction is exclusively for a court as one of law (and not for a jury in any respect), this Court necessarily decided that the issue also is one of law for appeals purposes. It would be tantamount to legal sophistry to withhold an issue from a jury

because it is a question of law, and then to transform the same issue into a question of fact on appeal when it is decided by a trial judge. Yet, that is the position urged in the Petition.[1]

The distinctions for purposes of review between a matter of fact and a question of law is ingrained into our system of appellate jurisprudence. It is well settled that appellate courts accept findings of fact that are not clearly erroneous, but decide questions of law *de novo*. *First Options v. Kaplan*, 514 U.S. ___, ___, 115 S.Ct. 1920, 1926 (1995); *Elder v. Holloway*, 510 U.S. 510, 516 (1994); *Pierce v. Underwood*, 487 U.S. 552, 558 (1988).

The Petitioner, however, says that such a rule is "unfair to litigants who invest heavily in the district court's trial process of receiving evidence and assessing claim construction, only to have the decision ignored by the appellate court." (Petition at pp. 16-17). This assertion rests on a fundamental misunderstanding of the appellate process and the role of a patent in defining the meaning of claims.

The claims of a patent define the metes and bounds of an invention. The patent and its prosecution history are public documents upon which persons are entitled to rely as aids in determining the meaning of a patent claim. These public documents, and especially the patent claims when clear on their face, establish what a competitor may or may not do in introducing a product to the market.

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[1] While essentially asking this Court to revisit the *Markman* Court's holding, it is noteworthy that the Petitioner never defines precisely what fact findings of the trial court the Federal Circuit should have given deference in this case.

"[I]t is only fair (and statutorily required) that competitors be able to ascertain to a reasonable degree the scope of the patentee's right to exclude." *Markman*, 52 F.3d at 978 (citing *Merrill v. Yeomans*, 94 U.S. 568, 573-74 (1877), and *Hogg v. Emerson*, 47 U.S. (6 How.) 437, 484 (1848)).

Armed with knowledge of the metes and bounds of a patent, a competitor may proceed to design around a patent. "Designing around" is not a wrong prohibited by the Patent Code, but benefits the patent system by furthering the constitutional purpose of promoting progress in the useful arts. *See Slimfold Mfg. Co. v. Kinkead Industries, Inc.*, 932 F.2d 1453, 1457 (Fed. Cir. 1991), and *Hilton Davis Chem. Co. v. Warner-Jenkinson Co.*, 62 F.3d 1512, 1520 (Fed. Cir. 1995) (in banc), *cert. granted*, ___ U.S. ___, 116 S.Ct. 1014 (1996). It is not only fair, but required, that the meaning of a patent claim be ascertained where possible from the patent. Otherwise, it would be virtually impossible to ascertain the scope of a patent to any reasonable degree. Scope would depend on the creativity of lawyers and experts at trial and not on the meaning conveyed by the inventor in the patent. The construction of the claims of a patent is exclusively within the province of a court as a question of law. *Markman*, 517 U.S. at ___, 116 S.Ct. at 1387.

Thus, irrespective of what practice the Federal Circuit may or may not follow in other cases where the meaning of a patent claim is ambiguous from reading the patent and its prosecution history, in this case, the Federal Circuit followed *Markman* and reached the only decision which is consistent with the language of the patent itself.

The Federal Circuit did not ignore the district court's decision. It carefully considered the district court's analysis and claims construction and found them flawed as a matter of law. The construction given the claims by the district court was inconsistent with the patent, and no quantum of extrinsic evidence can vary the meaning of a patent claim which is clearly evident from the patent. This process of independent review is not a waste of judicial resources: it demonstrates the efficient functioning of the appellate system to reach the correct result in cases where issues of law are the subject of the appeal. *See Salve Regina College v. Russell*, 499 U.S. 225, 231-32 (1991). This approach has been consistently followed by the Federal Circuit since its decision in *Markman* was affirmed by this Court. *E.g., Engel Indus. v. Lockformer Co.*, 96 F.3d 1398, 1403-04 (Fed. Cir. 1996); *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996); *Amhil Enters. v. Wawa, Inc.*, 81 F.3d 1554, 1558, 1562 (Fed. Cir. 1996).

II. The Federal Circuit's Decision Here Is Fully In Accord With *Markman* and Other Decisions Of This Court.

The Federal Circuit in this case, in according independent review to a district court's construction of a claim, acted in accordance with – not contrary to – *Markman* and other Supreme Court decisions. This Court's decision in *Markman* very plainly and directly held that the interpretation of disputed claims of a patent is entrusted exclusively to a court as a matter of law. As such, and as remarked by the Federal Circuit, it is subject

to a *de novo* standard of review. Nor are the cases cited by the Petitioner to the contrary.

In *Salve Regina College v. Russell*, 499 U.S. 225, 233 (1991), for example, this Court said that "deferential review of mixed questions of law and fact is warranted when it appears that the district court is 'better positioned' than an appellate court to decide the issue in question or that probing appellate scrutiny will not contribute to the clarity of legal doctrine." In *Markman*, this Court made it very clear that uniformity of decision was not served by submitting an issue of claim construction of a patent to a jury. *Markman*, 517 U.S. at ___, 116 S. Ct. at 1396.[2] Uniformity, however, clearly is served by independent review by the Federal Circuit, which is expert in patent matters, as this Court expressly recognized in *Markman*: "It was just for the sake of such desirable uniformity that Congress created the Court of Appeals for the Federal Circuit as an exclusive appellate court for

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[2] The Petition notes that Justice Stevens in his dissent in *Gasperini v. Center for Humanities*, 518 U.S. ___, ___, 116 S.Ct. 2211, 2227 (1996), characterized claim construction as a mixed question of law and fact. However, Petitioner fails to mention that in doing so, Justice Stevens also recognized that this Court already had decided in *Markman* that claim construction would be treated as a question of law subject to independent review by the appellate court. *Id.* Thus, whether or not the issue of claim construction is purely a legal question or a hybrid of law and fact, this Court already has instructed lower courts on how to handle the issue. By taking the issue completely away from a jury and entrusting it exclusively to the court, the issue is treated by trial courts and by appellate courts alike as a question of law with well known implications on appeal.

patent cases . . . " *Markman*, 517 U.S. at ___, 116 S.Ct. at 1396 (citing H.R. Rep. No. 97-312, pp. 20-23 (1981)).

Thus, the Federal Circuit is uniquely in a better position than a trial judge to decide patent matters, and is not disadvantaged in claim construction by an inability to measure demeanor and credibility. The Federal Circuit rejected the trial court's claim construction, which rested on extrinsic evidence, because that construction did not comport with the patent instrument as a whole. The Federal Circuit easily was in the position to make this call without having to draw or ignore inferences or marshal "facts." The patent in this case was the controlling instrument. Thus, like Petitioner's unsuccessful assertion of demeanor and credibility to support its argument that claim construction was a jury issue in *Markman* (116 S.Ct. at 1395), Petitioner's assertions of demeanor and credibility here to support deference to a trial judge's legal conclusion stand on even softer ground.

Moreover, contrary to Petitioner's assertion, this Court in *Winans v. Denmead*, 56 U.S. (15 How.) 330, 338-39 (1854), long ago recognized that claim construction is a question of law to be determined by a court. (See discussion of *Winans* in *Markman*, 517 U.S. at ___, 116 S.Ct. at 1392). *Winans* recognized that all patent construction inquiries such as (i) what is the structure or device, described by the patentee, as embodying his invention; (ii) what mode of operation is introduced and employed by this structure or device; (iii) what result is attained by means of this mode of operation; and (iv) does the specification or claim cover the described mode of operation by which the result is attained – are legal inquiries for a court.

In sum, the Petitioner asserts that "the trial judge, as the principal receiver and evaluator of the evidence, is better positioned to assess the meaning of terms used in patent claims than is the court of appeals." (Petition at p. 1.) Petitioner never tells us why, except to suggest the already rejected arguments of demeanor and credibility. As this Court recognized in *Markman*, the Federal Circuit is a specialized court in patent matters with the mandate of creating uniformity in decision. The Federal Circuit is the appropriate place to decide questions of law pursuant to traditional standards of *de novo* review. This is the very decision reached by this Court in *Markman*, in affirming the decision of the Federal Circuit in that case.

CONCLUSION

The Federal Circuit in this case found that the district court's construction of the claims of the patent was legally wrong – it erased an important limitation in the patent claims and it was inconsistent with the patent. Understandably unhappy with that result, Petitioner attempts to create a Supreme Court issue. The Petition, however, presents an issue which this Court already has decided in *Markman v. Westview Instruments*, 517 U.S. ___, 116 S.Ct. 1384 (1996). The proper construction of disputed limitations in a claim is treated as a question of law, and as such it is subject to *de novo* review. Accordingly, this

Court should deny the Petition for a Writ of Certiorari to review the judgment of the Court of Appeals for the Federal Circuit in this case.

February 25, 1997

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IN THE

Supreme Court of the United States

OCTOBER TERM, 1996

CRYO-TRANS, INC.,

Petitioner,

v.

GENERAL AMERICAN TRANSPORTATION CORPORATION,

Respondent.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

REPLY BRIEF FOR PETITIONER

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9/20

TABLE OF CONTENTS

Page

TABLE OF AUTHORITIES ii

REPLY BRIEF FOR PETITIONER 1

TABLE OF AUTHORITIES

Page

Cases

First Options of Chicago, Inc. v. Kaplan, 115 S. Ct. 1920 (1995) 2

Gasperini v. Center for Humanities, Inc., 116 S. Ct. 2211 (1996) 2

J.T. Eaton & Co. v. Atlantic Paste & Glue Co., No. 95-1380 (Fed. Cir. Feb. 11, 1997) 3

Markman v. Westview Instruments, Inc., 517 U.S. ___, 116 S. Ct. 1384 (1996) . . . . . *passim*

Markman v. Westview Instruments, Inc., 52 F.3d 967 (Fed. Cir. 1995) (in banc), *aff'd*, 116 S. Ct. 1384 (1996) 1, 2

Metaullics Sys. Co. v. Cooper, 100 F.3d 938 (Fed. Cir. 1996) 2, 5

Ornelas v. United States, 116 S. Ct. 1657 (1996) 2

Wainwright v. Sykes, 433 U.S. 72 (1977) 5

Wiener v. NEC Elec., Inc., 102 F.3d 534 (Fed. Cir. 1996) 2

Winans v. Denmead, 56 U.S. (15 How.) 330 (1853) . . 4

Statutes and Rules

Fed. R. Civ. P. 52(a) 4, 5

REPLY BRIEF FOR PETITIONER

1. Contrary to the principal argument advanced by Respondent GATC in opposition to the petition for a writ of certiorari (*see* "Brief in Opposition to Petition for Writ of Certiorari" ("Opp.") at 9), the Court in *Markman v. Westview Instruments, Inc.*, 116 S. Ct. 1384 (1996) did not "necessarily decide" the key issue regarding the standard of appellate review of a trial judge's construction of patent claims. The Court in *Markman* held only that patent claim construction is an issue for judges, not juries, to decide. *Id.* at 1387. GATC's reliance on the Federal Circuit's decision in *Markman*[1] (Opp. at 9-10) is misplaced since in reviewing that decision, this Court did not reach the standard of review issue. In contrast to the Federal Circuit, *this* Court has never concluded that all aspects of claim construction are to be reviewed without any deference to the trial court.[2]

2. GATC's critical argument that the trial court's claim construction should be reviewed "*de novo*" on appeal rests on a fundamentally flawed premise. GATC incorrectly assumes that the process of determining the meaning of disputed terms in a patent claim involves a pure question of law. Opp. at 9. To the contrary, as plainly shown in the instant case, the

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[1] *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir. 1995) (in banc), *aff'd*, 116 S. Ct. 1384 (1996).

[2] GATC's observation that this Court decided *Markman* less than a year ago (Opp. at 9) is of little, if any, significance to Cryo-Trans' petition. Cryo-Trans is not asking this Court to revisit whether there is a Seventh Amendment right to have a jury decide the meaning of patent claims. And given the Federal Circuit's exclusive jurisdiction in patent cases, the passage of time will not clarify or resolve the issue raised by the petition. The proper standard of review of the trial court's claim construction in patent cases is an important issue, arising in cases regularly being heard by the Federal Circuit, and is in urgent need of delineation by this Court.

interpretation of patent claims presents a "mixed" question of law and fact.

The Court in *Markman* expressly recognized claim construction as a "mongrel practice" that "falls somewhere between a pristine legal standard and a simple historical fact." 116 S. Ct. at 1390, 1395. Upon considering the historical treatment of claim construction in patent trials and the respective functional capabilities of judges and juries, the Court ultimately found "sufficient reason to treat construction of terms of art like many other responsibilities that we cede to a judge in the normal course of trial, *notwithstanding its evidentiary underpinnings*." *Id.* at 1395-96 (emphasis added). Thus, in view of the mixed nature of the claim construction inquiry, the trial court's claim construction is subject on appeal to a bifurcated review process requiring plenary review of the trial court's legal conclusions and review of underlying factual findings for clear error. *See First Options of Chicago, Inc. v. Kaplan*, 115 S. Ct. 1920, 1926 (1995).[3]

3. GATC attempts to justify the result in this case by asserting that the Federal Circuit has "consistently" reviewed claim construction *de novo* since its decision in *Markman*. Opp. at 13. In actuality, however, a minority of Federal Circuit judges have openly and directly questioned the propriety of the *de novo* standard in post-*Markman* opinions. *E.g.*, *Metaullics Sys., Co. v. Cooper*, 100 F.3d 938, 939 (Fed. Cir. 1996); *Wiener v. NEC Electronics, Inc.*, 102 F.3d 534, 539 (Fed. Cir. 1996). Indeed, Circuit Judge Rader,

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[3] Contrary to GATC's assertion (Opp. at 14 n. 2), the authority of an appellate court to "independently review" mixed questions of law and fact does not preclude deference to underlying fact findings. *See Ornelas v. United States*, 116 S. Ct. 1657, 1663 (1996); *see also Gasperini v. Center for Humanities, Inc.*, 116 S. Ct. 2211, 2227 (1996) (Stevens, J., dissenting).

recognizing the "troubled intersection between legal and factual analyses in [the Federal Circuit's] post-*Markman* jurisprudence," has recently urged against *de novo* review of claim construction. *J.T. Eaton & Co. v. Atlantic Paste & Glue Co.*, No. 95-1380, slip op. at 12 (Fed. Cir. Feb. 11, 1997) (Rader, J., dissenting).[4] Relying on this Court's decision in *Markman*, Judge Rader cautioned that merely because

> claims must be construed by the court does not divorce the interpretive process from a host of inherently factual subsidiary matters, such as how one skilled in the art would understand claim terms and prosecution history statements. This court's role in reviewing claim meanings discerned by the district courts calls for modesty and restraint--born not of timidity, but of recognition of the limits inherent in appellate review. [*Id.* at 12-13 (citation omitted)].

4. GATC's contention that the trial court ignored the '876 patent in determining the meaning of that term (Opp. at 6) is unsupportable. To the contrary, the district court's opinion manifests its extensive consideration and clear understanding of the patent specification, drawings and claims. Pet. App. 41a-46a. But unlike the Federal Circuit, the district court's claim construction analysis was further informed by consideration of evidence which the trial judge was in a unique position to evaluate, such as the testimony of expert witnesses, the inventor, and GATC's director of engineering, and the visual inspection of a physical embodiment of the claimed invention. *Id.* at 19a-20a. That evidence and the fact findings based thereon were ignored under the Federal Circuit's *de novo* review.

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[4] The decision issued after the filing of the petition.

5. GATC does not dispute that the result on appeal would have been different had the Federal Circuit applied the proper standard of appellate review. GATC readily admits that under the trial court's interpretation of the disputed claim term "adjacent," GATC's accused railcars infringe the '876 patent.[5] Opp. at 3. The Federal Circuit's failure to accord due deference in reviewing the trial court's claim construction ruling led to a reversal of the district court's judgment of infringement. In reaching that incorrect result, the Federal Circuit conducted an independent claim construction analysis, wholly without regard to the findings that compelled the trial court to conclude that GATC's accused Arcticar railcar contained vents or openings "adjacent" to the end walls, as claimed in the '876 patent.

Pursuant to Rule 52(a) of the Federal Rules of Civil Procedure and consistent with this Court's decision in *Winans v. Denmead*, 56 U.S. (15 How.) 330 (1853), the trial court made a number of critical factual findings *en route* to arriving at its conclusion that the term "adjacent" means "not far off," including determination of the structure of the claimed device, the mode of operation employed by the device, and the result attained by this mode of operation.[6] *See* Pet. App. 41a-46a, 52a-53a. Under the rules governing civil practice in the federal courts, factual findings in actions tried without a jury "shall not be set aside unless clearly erroneous, and due

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[5] GATC stipulated that its Arcticar contained each and every limitation of claim 1 of the '876 patent except bunker vents "adjacent" to the end walls. Pet. App. at 52a.

[6] GATC's bald assertion that the *Winans* factors are "legal inquiries" only underscores its basic confusion regarding the factual and legal aspects of the claim construction inquiry and illustrates its tendency to sweep the former into the latter in attempting to justify the *de novo* approach used by the Federal Circuit.

regard shall be given to the opportunity of the trial court to judge of the credibility of the witnesses." Fed. R. Civ. P. 52(a). Hence, as one Federal Circuit panel has correctly noted, "[w]here a district court makes findings of fact as a part of claim construction, we may not set them aside absent clear error." *Metaullics*, 100 F.3d at 939.

The Federal Circuit did not determine the trial judge's findings underlying his claim construction to be clearly erroneous. The court set them aside by simply ignoring them. Had the Federal Circuit followed the precedent of this Court regarding review of mixed law/fact questions, it could not have properly reversed the judgment of infringement. The Federal Circuit's practice of according no deference to underlying findings of fact in this and other post-*Markman* cases highlights the need for immediate review and clarification by this Court.

6. Finally, the Federal Circuit panel that reversed the judgment below was not, as GATC suggests (Opp. at 15), "better positioned" than the trial court to consider the evidence adduced at trial and to make the requisite findings necessary to construe the claims properly. To be sure, in allocating the task of interpreting claims as between the trial court and the court of appeals, functional considerations alone dictate that the trial court, which stands as the principal receiver and evaluator of evidence, should serve as the primary forum for undertaking the task of construing claims in patent infringement actions. To conclude otherwise would render the trial court irrelevant, a result which could not have been intended by Congress in establishing the Federal Circuit. However, the practical effects of the Federal Circuit's decision in this case is to reduce the trial to nothing more than a "tryout on the road." *Wainwright v. Sykes*, 433 U.S. 72, 90 (1977).

Thus, for the reasons stated herein, as well as in the petition, petitioner respectfully submits that this Court should grant a writ of certiorari to review the Federal Circuit's decision in this case.

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